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ORIGINAL CONTRIBUTIONS

METHODS FOR THE CONTROL OF SCARLET FEVER*

Geo. F. Dick, M.D.
CHICAGO, ILL.

Scarlet fever is probably one of the oldest known diseases. The earliest medical manuscripts contain descriptions of acute diseases accompanied by rashes. At first the various rashes were confused. On account of its characteristic pustular lesions, smallpox was soon differentiated from the other exanthemata. But the confusion between measles and scarlet fever persisted until the seventeenth century, when Sydenham clearly differentiated one from the other.

After the development of Jenner's vaccination against smallpox, attempts were made to employ a similar method of vaccination against scarlet fever on the assumption that the organism which caused the diseases would be present in the skin of the scarlet fever patient. These attempts at vaccination against scarlet fever by means of skin scales were not successful, and the knowledge of scarlet fever was at a standstill during the next hundred years, until the development of the science of bacteriology revealed the presence of a variety of organisms associated with scarlet fever, predominant among which were streptococci and chiefly the hemolytic streptococcus.

But similar organisms were also demonstrated in various other diseases, such as puerperal sepsis, erysipelas and lymphangitis. There was no way of differentiating these various streptococci and no one succeeded in establishing the streptococcus as the cause of scarlet fever. It became generally accepted that this disease must be due to a filterable virus, but it was not possible to prove this theory, and, during the next fifty years, there was another pause in progress.

As the result of work published in 1923, which included the production of experimental scarlet fever in human beings, we were able to demonstrate that a specific hemolytic streptococcus is the cause of scarlet fever. In most cases this streptococcus does not invade the blood stream but remains localized in the throat, where it causes the angina, and in addition produces a toxin which is absorbed into the blood and carried to all parts of the body.

We were able to demonstrate that this toxin is responsible for the characteristic symptoms of scarlet fever, including the nausea, vomiting, fever and rash. By injecting comparatively large doses of the sterile toxin, we succeeded in reproducing these symptoms in susceptible human beings.

The discovery of the specific toxin of scarlet fever enabled us to develop:

1. A skin test to determine which individuals are susceptible to scarlet fever, and which are immune.

2. A method of immunizing the susceptible in-

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* Read before the Thirty-eighth Annual Meeting of Washington State Medical Association, Tacoma, Wash., Aug. 29-31, 1927.

dividuals against scarlet fever so that they do not contract the disease on exposure.

3. An antitoxin specific for scarlet fever, and
4. A method of recognizing scarlet fever streptococci.

These four applications of the specific toxin furnish the means of controlling scarlet fever.

The skin test to determine susceptibility is made by injecting intradermally 1/10 cubic centimeter of a dilute solution of scarlet fever toxin. The injection should be made on the anterior surface of the forearm, at the junction of the upper and middle thirds. The test is observed twenty to twenty-four hours after it is made. The observation should be made in a bright light. An area of reddening one centimeter or over, in any diameter, constitutes a positive reaction and indicates some degree of susceptibility to scarlet fever.

The positive reaction to scarlet fever toxin differs from the positive Schick test in being more transient and showing no induration. The Schick test for susceptibility to diphtheria may be observed two to four days after the test is made, but reactions to scarlet fever toxin have usually disappeared in thirty to forty-eight hours, so that results of observations made more than twenty-four hours after the skin test dose of scarlet fever toxin is injected, would not be reliable. On the other hand, the test should not be observed too soon, not earlier than twenty hours. The positive reaction to scarlet fever toxin may vary from a very faint pinkish flush to an intense red, according to the degree of susceptibility of the individual. It may range from one to five centimeters in diameter. The most strongly positive reactions are usually accompanied by slight superficial swelling, without any induration. We have been impressed with the number of positive skin tests that have been interpreted as negative, especially by physicians accustomed to making Schick tests. It is almost the usual thing for slightly positive reactions to be regarded as negative by those who have not had considerable experience with skin tests for susceptibility to scarlet fever.

If the skin test solution is properly prepared it is not necessary nor advisable to use a control, for pseudoreactions are uncommon.

It is pointed out in our earlier publications, that the skin test was devised as a means of determining susceptibility to scarlet fever and that it is not a diagnostic procedure. Subsequent experience has shown that this view is correct, but in spite of the warning some observers have attempted to employ the skin test for the diagnosis of scarlet fever. This is a mistake, for while it is true that the skin test is positive before an attack of scarlet fever and usually negative after the attack, it may become negative in the first forty-eight hours of the disease, before the full development of the rash, and in rare cases the skin test is modified, but still positive after an attack of scarlet fever.

While the use of the skin test with the toxin should be limited to the determination of susceptibility to scarlet fever, the blanching test with scarlet fever antitoxin, which will be described later, is helpful in the diagnosis of suspected rashes. Correctly made and interpreted with accurately standardized and properly prepared material, the skin test has proved a reliable means of determining susceptibility to scarlet fever.

The number of susceptible individuals in any group will vary according to age and previous exposures to scarlet fever. In crowded city schools or institutions the number susceptible may be as low as 15 per cent. In less crowded districts or in younger age groups more than 60 per cent may be found susceptible. Many cases of scarlet fever are so mild that they are not diagnosed clinically. This probably accounts for the immunity in those persons who give no history of scarlet fever but have negative skin tests.

In a series of 30,000 skin tests including all ages, 40 per cent were positive and 60 per cent negative. No case of scarlet fever occurred in persons with negative tests, and 67 cases have been observed in persons who had shown positive skin tests before exposure to scarlet fever.

Persons who are susceptible to scarlet fever may be immunized by means of subcutaneous injections of graduated doses of sterile scarlet fever toxin. It is important that the toxin for immunization be properly prepared, so that it contains a minimum amount of foreign protein, and no horse serum or other animal serum. The dosage should be correctly graduated, so as to give no harmful reactions, yet confer adequate immunity.

We are at present advising the use of the following dosage which we have found safe and effective:

A first dose of 500 skin test doses of toxin,
A second dose of 2,000 skin test doses,
A third dose of 8,000 skin test doses,
A fourth dose of 25,000 skin test doses,
A fifth dose of 65,000 skin test doses.

Give subcutaneously at intervals of five to seven days.

This dosage may be counted on to immunize more than 90 per cent of susceptible persons to the point of an entirely negative skin test and modify the susceptibility of the remainder.

It should be emphasized that unless the immunization is carried to the point of an entirely negative skin test, complete protection from scarlet fever cannot be expected, though the severity of any subsequent attack would be modified by the partial immunization. Two weeks after the last immunizing dose of toxin is given, another skin test should be made. If it is not entirely negative, the last immunizing dose should be repeated. In a series of 4,147 susceptible persons immunized with the dosage mentioned, no harmful reactions have occurred.

There is practically always some local reaction about the site of injection in the upper arm. This consists of reddening, with more or less swelling which begins to subside in forty-eight hours. No necrosis, abscesses or sloughs have occurred.

There may or may not be a general reaction, depending on the degree of susceptibility of the person being immunized. The most severe general reactions which occur consist of general malaise and nausea, accompanied by a rise in temperature. These symptoms may appear within a few hours, and usually subside the following day. There may be a light, scarlatinal rash which disappears in forty-eight hours. Such reactions are not common and do not follow all doses, even in highly susceptible individuals. General reactions are most likely to occur after the first, second or third dose. By the time the large doses are reached, enough immunity has been acquired to prevent reactions. As a rule the reactions which occur during the course of immunization against scarlet fever are about as severe as those which follow the use of typhoid vaccine or diphtheria toxin-antitoxin mixtures.

While it is not possible at present to give statistics on the duration of the active immunity resulting from administration of these graduated doses of toxin, experience to date indicates that the immunity obtained is comparable in duration to that obtained with immunization against diphtheria, with proper use of diphtheria toxin-antitoxin mixtures. It is considerably more satisfactory than immunity obtained with some commercial preparations of diphtheria toxin-antitoxin now on the market.

Scarlet fever antitoxin is obtained by immunizing horses with gradually increasing doses of sterile scarlet fever toxin injected subcutaneously. When the horse is producing a good antitoxin, he is bled and the serum is separated and refined by the methods employed for refining and concentrating diphtheria antitoxin. This process removes unnecessary foreign proteins, so that the resulting antitoxin causes fewer and less severe reactions and is of higher potency.

The finished antitoxin is standardized against the toxin and its potency is expressed in the number of skin test doses of toxin neutralized by one cubic centimeter of antitoxin. The therapeutic dose of antitoxin should be about three hundred thousand of these neutralizing units, and the prophylactic dose should contain about one hundred thousand neutralizing units. No satisfactory method of standardizing the antitoxin has been found that does not involve the use of skin tests in human beings. Some observers claimed that goats could be used for this purpose but they are not suitable and serums standardized on goats have been found unreliable. On account of the difficulty of standardization, it has not been possible for the Hygienic Laboratory of the United States Public Health Service to check the claims of the manufacturers. Consequently there are several preparations of scarlet fever antitoxin on the market which bear on their labels grossly exaggerated claims for potency. Some of these antitoxins are labelled as containing 50,000 or 60,000 neutralizing units per cubic centimeter. When tested they are sometimes found to have less than 10 per cent of the potency claimed.

We have tested no antitoxin containing even 40,000 neutralizing units per cubic centimeter. The most potent antitoxin yet obtained contains 35,000 neutralizing units per cubic centimeter. If an antitoxin actually contains as much as 30,000 neutralizing units, ten cubic centimeters, or 300,000 units is an adequate therapeutic dose.

It has been shown that properly standardized scarlet fever antitoxin, given in sufficient dosage early in the disease, shortens the course of scarlet fever and reduces the frequency and severity of complications. In order to be most effective, the antitoxin should be given as soon as the rash begins to appear. With every day of delay in administering the antitoxin there is a diminution in the benefit derived from it. If the antitoxin is withheld until late in the disease, the tissues of the body may be damaged past repair.

There is considerable variation in the severity of scarlet fever. There are mild forms in which the chief object in giving antitoxin is to reduce the chance of complications to a minimum. From the mild forms there are all possible gradations to the fulminating toxic type, in which the patient succumbs in a few days to the toxemia.

The therapeutic dose of antitoxin adopted by The Scarlet Fever Committee, and put out by manufacturers, licensed by the Committee, is adequate for the ordinary mild to moderately severe case of scarlet fever. Within twelve to eighteen hours after the antitoxin is given in an early case, there is an improvement in the general condition of the patient. The temperature falls, and the rash begins to fade. In more severe cases, especially in those complicated by sinus infections, it is sometimes necessary to give a second therapeutic dose of antitoxin, eighteen to twenty-four hours after the first dose. In extremely toxic cases, with high temperature and delirium, it is advisable to give two therapeutic doses at once.

Occasionally one sees cases of scarlet fever of several days' duration, in which septicemia has developed and the tissues are injured to such an extent that no method of treatment can be expected to effect a cure. In these cases there is usually a marked reduction in the amount of urine or anuria. An effort should be made to administer antitoxin early enough to prevent the development of such conditions.

In doubtful rashes the diagnosis may frequently be established by injecting 2/10 of a cubic centimeter of scarlet fever antitoxin intradermally, in an area where the rash is brightest. The result is observed in eighteen to twenty-four hours. If the site of injection is surrounded by a zone in which the rash is blanched, it may be concluded that the rash is that of scarlet fever since the blanching is due to the neutralization of the scarlet fever toxin by the antitoxin in the locality of the injection. These blanching tests are sometimes difficult to see, especially if the rash is two or three days old. It is best to stand some distance from the patient in making the observation. In case there is an increased redness at the immediate site of injection, due to irritation from the serum or preservative contained in it, it is often possible to see a zone of blanching surrounding the central red spot.

The disease most commonly confused with scarlet fever is German measles. Since the rash of German measles is not blanched by scarlet fever antitoxin, the blanching test furnishes a means of differential diagnosis between the two diseases.

Besides its use in the treatment of scarlet fever and in the diagnostic blanching test, scarlet fever antitoxin is given in prophylactic doses to prevent the development of scarlet fever in susceptible persons who have been recently exposed to the disease.

If possible it is best to make nose and throat cultures on blood agar plates, and examine them for hemolytic streptococci before giving the prophylactic dose of antitoxin. Comparatively few of the contacts contract scarlet fever on any single exposure. This is due to the fact that some of the contacts are not susceptible to scarlet fever and that those who are susceptible may not become infected. If a person is not susceptible, or if he is susceptible but not infected, he does not need antitoxin.

In case the skin test is positive, indicating susceptibility to scarlet fever, and the nose or throat culture is positive for hemolytic streptococci, the prophylactic administration of scarlet fever antitoxin is justified. It should be kept in mind that protection with the antitoxin is an emergency measure which affords only temporary immunity.

As soon as the antitoxin is eliminated from the body, the patient again becomes susceptible to scarlet fever and may contract the disease on a subsequent exposure. The protection conferred by a prophylactic dose of antitoxin cannot be expected to last more than ten days to two weeks. It should be followed by active immunization with the toxin, which results in more lasting protection.

In making nose and throat cultures for hemolytic streptococci, the question will naturally arise as to whether the hemolytic streptococci found are scarlet fever streptococci or some other, and nonspecific hemolytic streptococci. The differentiation of scarlet fever streptococci is accomplished by testing the organisms in question for specific toxin production.

This is done by culturing the organism in plain broth, to which a small amount of sterile human blood has been added. The broth culture is incubated from two to four days, filtered through a Berkefield "W" filter to remove the bacteria, and the sterile filtrate is tested for the presence of scarlet fever toxin. This procedure requires about the same time and facilities that are needed in testing diphtheria cultures for virulence. It is, therefore, impractical for those who do not have rather extensive laboratory facilities, and it may be left to the Health Deparmtent Laboratories.

Fortunately, this test for specificity is not necessary in the majority of instances. It is required only in cases of persistent carriers and under conditions similar to those that necessitate tests for virulence of diphtheria bacilli.

The methods employed to prevent scarlet fever in families, institutions or communities differ according to whether or not scarlet fever is epidemic at the time. It is simpler to test and immunize during the summer months when scarlet fever is not prevalent, than in the winter when exposure to scarlet fever may complicate the situation.

If scarlet fever is not present in a community, it is only necessary to make skin tests and immunize those who show positive skin reactions, with graduated doses of the toxin. If scarlet fever is present in the community or institution at the time control of the disease is undertaken, the situation is more complicated. The first thing to be done is to make skin tests on every one, and at the same time make nose and throat cultures on blood agar plates.

The cultures are incubated over night and examined in the morning for hemolytic streptococci. Those concerned are divided into infected and noninfected groups, according to whether or not hemolytic streptococci are found in their cultures. It is not necessary to test these cultures for specificity. The skin tests are observed at the end of twenty to twenty-four hours. It will be found that the infected group contains a number of persons who are immune to scarlet fever, as demonstrated by negative skin tests. On account of this immunity they will not contract scarlet fever themselves, but should be quarantined as immune carriers who might infect others. They do not require any treatment and may be released from quarantine after all the susceptibles have been immunized.

The infected group will also contain some who have positive skin tests and are, therefore, known to be susceptible to scarlet fever. These susceptible and infected persons are in danger of developing scarlet fever. They may be given prophylactic doses of antitoxin at once or they may be watched closely and given a therapeutic dose of antitoxin on the first appearance of sore throat, malaise or fever.

In the noninfected group there will be some with negative skin tests who do not require any further attention, except to be kept from contact with the infected group The reason for this is that on such contact they might be infected and become immune carriers. The noninfected group will also contain a number of persons with positive skin tests indicating susceptibility to scarlet fever. In these active immunization with the graduated doses of toxin may be begun at once.

The quarantine between infected and noninfected groups should be maintained until immunization of the susceptibles has been completed. One week after the work is started immunization of the susceptibles in the infected group may be begun, regardless of whether they have had antitoxin or not.

Cultures are taken once a week in the infected group, and as they become negative, the individuals concerned are transferred to the noninfected group. It is not worth while to take cultures oftener than once a week.

After the fifth immunizing dose of toxin has been given in the noninfected group, the quarantine may be raised on the infected group and the two groups may be permitted to mingle. Retests are made two weeks after the last immunizing dose of toxin and extra doses are given where indicated.

If it is not possible to obtain cultures on blood agar plates, the control of an epidemic of scarlet fever is more difficult. Skin tests are made and the persons tested are divided into two groups, according to whether or not they are shown to be susceptible. Daily observations of the susceptible group are necessary, with administration of prophylactic antitoxin on the appearance of symptoms of sore throat, fever or malaise. Active immunization is begun at once in the susceptible group. Since it is not possible without cultures to isolate the carriers, the susceptible persons are in danger of becoming infected and contracting the disease until their immunization has been completed.

An epidemic of scarlet fever cannot be controlled by the use of prophylactic doses of antitoxin alone because, as already pointed out, the antitoxin protects for only ten days to two weeks which is not sufficient time for the infected carriers to get rid of the organisms.

It is important in any family or institution to obtain cultures on all possible contacts, the help, visitors, janitor, cooks, waitresses, etc., as well as the immediate group seeking protection, for one unrecognized carrier may frustrate the most elaborate attempts to control an epidemic. There have been several such instances in our experience, as where a christian scientist employed in some capacity about an institution, or a teacher or a cook refused to have a culture taken.

Later, when cases of scarlet fever continued to occur in the noninfected group and these objectors were given the choice of dismissal or culture, they were found infected and the new cases of scarlet fever were traced to direct contact with them. On account of these experiences, we now insist that anyone who refuses culture be placed under quarantine in the infected group.

We have employed the methods of control outlined here during the past three years in private families, schools and institutions. The results are now available from a series of approximately fifteen thousand persons directly exposed to scarlet fever immediately before or after testing and immunization. In this series no case of scarlet fever has occurred in a person with a negative skin test. Nor has any case of scarlet fever occurred in persons with positive skin tests who had been immunized with graduated doses of toxin to the point of a negative skin test. On the other hand, in the control series where susceptible persons refused immunization or the ricinoleated preparations of toxin or so-called ricinoleated antigen were used, a number of cases of scarlet fever occurred following exposure.

It has been demonstrated that by the use of skin tests, active immunization, passive immunization and quarantine based on nose and throat cultures, an epidemic of scarlet fever can be controlled within forty-eight hours.

Scarlet fever has been eliminated from the nursing and interne staffs of contagious disease hospitals by regulations which require that prospective nurses and internes report for tests and immunization before beginning duty in the hospital.

A word in regard to commercial preparations of scarlet fever toxin seems appropriate here. There are some ricinoleated preparations of scarlet fever toxin, described by Larson, on the market which it is claimed will immunize against scarlet fever in one or two doses. It is also claimed that these preparations are detoxified and will not cause reactions. Tests have shown that these preparations are not detoxified. Most of them contain from one to three thousand skin test doses of free toxin per cubic centimeter. This amount is too large to be safe for a first dose and considerably too small to confer a satisfactory immunity.

Experience during the past winter in institutions where these preparations were used has shown that neither the claim as to detoxification nor immunization is justified. Institutions came under our observation, where attempts had been made to control scarlet fever by the use of a commercial preparation of ricinoleated toxin. Skin tests made on these groups indicated that they had not been successfully protected against scarlet fever. This conclusion was substantiated by the occurrence of scarlet fever in individuals who had received the ricinoleated antigen.

For the present, at least, it is best to employ the five graduated doses of toxin in active immunization against scarlet fever.

INTERMITTENT DUODENAL STENOSIS *

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The question of intermittent duodenal stenosis with at times resultant duodenal dilation and stasis, whether due to anomalous bands and membranes—hepatoduodenal or hepatoduodenal colic—or to what we shall call for the moment a true arteriomesenteric drag, was, prior to five or six years ago, of interest only when found at operation or postmortem, a clinical or preoperative diagnosis of the condition, if made at all, being at best a guess.

Since that time, due to keener x-ray diagnosis and the question of its relation to migraine, much more is being heard about this condition, especially that of the "superior mesenteric artery pressure" type. As to the latter Wilkie[1] confesses that he first recognized a case during life in February 1920, having found it at operation, his preoperative diagnosis of the case having been stone in the common duct. There have been many excellent articles from him on the subject which is now generally conceded to be a definite pathologic entity. This paper being primarily one from the standpoint of x-ray diagnosis, no attempt shall be made to present a complete chronologic history of the development of the subject.

The many articles written prior to 1920 and the majority of those since deal with the subject mainly from the surgical standpoint, the cases quoted not being preoperatively diagnosed. Even yet the diagnosis by x-ray is being considered by many more fortuitous than otherwise.

The papers, however, of the Kelloggs[2] of New York, McKenty[3] of Winnipeg and McConnell[4] and Nesbitt[5] of Dublin, lay particular emphasis on the x-ray as a means to a diagnosis, while the excellent papers of Taylor[6] of New York, Carter[7] of Brandon, Manitoba, and Quain[3] of Bismarck, North Dakota, stressing anomalous bands as a prime factor in many of these cases, do not seem yet to have received the recognition they deserve.

Case 24 (see fig. 32), so numbered for convenience in presenting the recent cases more thoroughly studied, was the first case I had seen. The clinical

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* Read before the Thirty-eighth Annual Meeting of Washington State Medical Association, Tacoma, Wash., Aug. 29-31, 1927.

diagnosis was hyperacidity and gastric neurosis. It was completely overlooked at x-ray examination. An exploratory operation revealed the condition. A more critical x-ray study by the writer in the following two years at the Cleveland Clinic, of a large number of cases whose prevailing symptoms were of the migraine type, the periodical so-called bilious attacks, has been the basis of this paper. In April, 1925, before the Cleveland Radiological Society, my first paper was presented showing many cases, eleven of which had been operated upon during the previous twelve months, the x-ray diagnosis being confirmed in all.

Since then eight more cases personally observed have been operated upon with a correct preoperative x-ray diagnosis and a great many cases have been treated medically. The further experience thus gained warrants a revision of my former paper incorporating many new points.

The subject of chronic duodenal stenosis admits of division into three types: (1) That of the bulb; (2) that of the second and third portion, due to bands and membranes either above or below the mesocolon and; (3) duodenalarteriomesenteric ileus which we have found it hard to conceive of as being due to any other cause than a pure mesenteric drag. Of late, however, there have been excellent papers by outstanding writers on the subject, attributing the cause to derangement in the involuntary nervous system. The most fascinating article bearing on this is by Frazer of Edinburgh, in *Surgery, Gynecology and Obstetrics* for March, 1927. Yet, he says, he is convinced that an imperfect attachment of the cecum and ascending colon to the abdominal wall is a frequent, in fact a constant accompaniment, of these functional disorders. We have invariably found this abnormality present in our cases and the logic of the "drag" caused by the condition still appeals to us.

It is with the latter two types that we are mainly concerned and we shall endeavor to show by presentation of cases that the roentgenogram is by far the most important factor, if not the only means of diagnosis, and that it should show in the vast majority of cases whether intermittent duodenal stenosis is or is not present. The prevailing clinical diagnoses made in these cases are usually cholecystitis, gastric or duodenal ulcer, appendicitis, constipation and gastric neurosis, and very recently migraine.

In the type due to anomalous constricting bands, we have to differentiate those occurring above from those below the mesocolon. In those above, the bands are from the duodenum to the gallbladder or liver and cause dilatation of the first half of the duodenum. Pain here is of the duodenal ulcer or gallstone colic type. These cases are particularly rebellious to medical treatment.

Compression below the mesocolon due to bands is rarer than the preceding type. Toxic symptoms are more pronounced and bilious vomiting more common. While vomiting is frequent, yet we must not always expect it, as nausea may be a more predominant feature.

Of arterial compression of the duodenum there are two varieties: (a) by the pedicle of the mesentery, in which the superior mesenteric artery is incorporated, due to congenital shortness of the mesentery with massive ptosis of the small intestine; (b) by the colica media, where the right colon which it supplies, due to lack of prenatal fusion and loss from any cause of intraabdominal pressure-traction falls on this branch which may easily cause traction on the trunk. These latter two types should be differentiated for, if surgical treatment is being considered, a different type of operation is necessary in each case.

SYMPTOMATOLOGY

There is usually stomach trouble of long duration often since childhood. Periodical so-called "bilious" attacks, with nausea and often vomiting, the typical migraine symptom-complex, are common and most significant, the attack often being ushered in by marked constipation and usually accompanied by headaches which in the female are independent of the menstrual period. Females to males are in the proportion of two or three to one, and the usual age period of full blown attacks is between twenty and forty, but children may present the same symptoms. Pain may be violent or absent, its situation variable, as well as its relation to food or its ease by food or soda.

Certain posture often gives great relief, especially when occlusion by root of mesentry is at fault. While constipation is the rule, there are often intermittent diarrheal attacks. Cecal stasis may often dominate the picture, especially when there is a right sided ptosis, the duodenal compression being secondary, due to drag on the colica media. If the duodenal compression is in region of the ampulla of Vater, we may have an enlarged and sensitive liver and gallbladder, with pain in the region of the right costal arch.

There is often loss of weight and strength with mental and physical depression, disturbed heart action, cold extremities, hyperesthesia, paresthesia, skin eruptions, low blood pressure, subnormal temperature and other evidence of duodenal intoxication. Buchanan[9] says, "bilious attacks are practically always a part of migraine and not of something more serious; the first evidence of the migraine character may occur in infancy as cyclic vomiting and the prediction can be made with a high degree of assurance that the child will be subject to migraine cycles later in life."

With such symptoms persisting over a long period, a state bordering on neurasthenia may well arrive and one's first impression often is of a functional element of exaggeration. Hence the frequent diagnosis, "gastric neurosis."

ETIOLOGY

Of our present series of thirty-eight cases all have had a very complete examination both clinically and radiologically with repeated rechecks. The Graham "dye" test for gallbladder visualization was carried out in the adults; the appendix region was carefully inspected at x-ray examination and consultation had with nose and throat specialists with reference to sinus pathology.

Of nineteen cases operated on, of the entire series from which this study is made, no other pathology was found than that due to mesenteric pressure or membranes. There is much controversy with regard to the cause in arteriomesenteric ileus. That it is due to a neuromuscular derangement above the duodenal rudimentary sphincter is the belief now of Devine,[10] Robertson[11] and Frazer, already quoted. On the other side, we seem to have a preponderance of those favoring the superior mesenteric artery pressure theory.

McKenty finds a right sided ptosis in nineteen out of his twenty-six cases, and with one exception the only cause was compression by the root of the mesentery. McConnell finds a right sided ptosis in thirty-seven out of thirty-eight cases. Nesbitt had four cases in his wards at one time, doing a cecopexy in three. Wilkie says two conditions are responsible: (1) empty small intestines hanging over pelvic brim without resting on the floor of the pelvis, the mesentery being then folded like a fan and exerting a uniform drag in the vertical direction; (2) congenital lack of fixation of proximal colon, where cecum and ascending colon prolapse into the pelvis, in other words, a right sided ptosis and exact traction on the mesentery in the line of the superior mesenteric artery.

Rehfuss[12] says chronic stenosis of duodenum is not uncommon and gives pressure of the mesentery or superior mesenteric artery as one of the causes of the intermittent type. Beclere attributes compression of mesenteric vessels as one of the great causes and impresses the fact that the condition is best shown at upright fluoroscopic examination, as it may disappear in the prone position.

Horsley[14] mentions pressure by the superior mesenteric vessels and also stresses that the examination should be made in the symptom period.

The Kelloggs, in their exhaustive paper, also subscribe to compression of the duodenum between the vertebral column behind and the superior mesenteric artery in front.

Halpert[15] differentiates the arteriomesenteric drag from the arteriomesocolic, suggesting a duodenojejunostomy for the former and for the latter a resection of the cecum or colopexy.

Brams,[16] adding an additional series of ten cases to those already reported by him on "migraine with abdominal equivalent," states that of the five of these ten cases operated upon no pathology was found. We feel that here the mesenteric pressure, resulting from mobile ceca and ascending colon, may have been at fault, the condition being readily overlooked by the surgeon unless specifically sought for.

Quain lays the blame on the radiologist for not discovering more frequently evidence of periduodenal membranes and of pathologic duodenal retention. We accept the blame but only to the extent of about twenty-five per cent. The surgeon and internist will have to accept the rest until they familiarize themselves with the possibilities of screen study in these cases, and make more specific inquiries as to the behavior of the distal duodenum after taking the barium meal.

Alvarez, in a recent article on how to make a diagnosis from a good history, does not mention the condition, neither does Deaver in a recent article on upper abdominal disease.

DUODENAL INTOXICATION

A proper conception of this condition fails us, unless we have a thorough understanding of duodenal physiology. In spite of the relative mildness of the motor troubles, there may be evidence of profound duodenal intoxication. Peristaltic contractions as well as rhythmic contractions of the duodenum, according to Wheelon,[17] assure a passage through the duodenum of food in eight to ten seconds, and Holtzknecht of Germany gives the same time.

So that in duodenal stenosis, instead of fragmentary evacuation, intermittent and rapid, the food fills the duodenum and distends it during the entire duration of gastric digestion. The farther along in the duodenum the obstruction, the graver the symptoms. They are but slightly marked in stenosis of the duodenal cap, which we are not here considering.

The cause of the symptoms is not yet elucidated, as the exact nature of the poisons is unknown. (a) According to some authors the toxic substances are created by the duodenum. (b) According to others they are produced at the expense of duodenal secretions under the influence of bacteria which develop in the stagnant duodenal secretion. Draper,[18] Whipple[19] (American authors), Roger and Garnier[20] (French authors), say it is a toxic secretion.

The Dragstedts[21] claim that it is an alteration of the duodenal retained secretions by proteolytic bacteria and that duodenal secretion without stagnation is not extremely toxic.

It is the relative retention of the toxic contents in the duodenum, which in general is traversed so rapidly, that facilitates absorption there and this absorption is the more rapid as pressure in the obstructed loop is raised (the "intraduodenal tension" of which Rehfuss speaks) and as the peristaltic movements are increased. In the production of symptoms according to physiologists, the factors which increase intestinal absorption are more important than those which produce toxins.

RADIOLOGIC TECHNIC

The technic used can best be followed by a careful study of the cases described. The radiologist must always remember he is a physician and not merely a technician. He should have a history of the case submitted beforehand or obtain it for himself at the time of examination. Consultation with the surgeon or internist is the ideal, but as to the scope and manner of examination the radiologist should act entirely on his own initiative.

Much inspiration and many valuable suggestions have been obtained from Dr. Coffey's excellent monograph on enteroptosis, from Etudes sur le Duodenum by Duval, Roux and Beclere, and from Dr. Jordan's work on chronic intestinal stasis.

My especial thanks are due my colleague, Dr. Shaw, for his ideal cooperation and for having written the outline of the treatment he is using in these cases.

TREATMENT

Treatment should be undertaken only by one familiar with the orthopedic principles involved, and with the malstatics which in our opinion are the result, not the cause of the intestinal tract anomalies found, and by one who has familiarized himself with the x-ray evidence by screen observation.

The matter of diet assumes an important role, since only by marked gain in weight may intraabdominal fat be deposited and thereby intraabdominal pressure raised. Instead of eliminating carbohydrates, eggs, milk, etc., from the diet, these together with fats and sugars are forced. Milk and cream with meals and at bedtime are prescribed with also a light midmorning meal. Olive oil is taken before each meal. Printed detailed diets are furnished each patient.

Attention to posture and malstatics is observed by absolute rest in bed for seven weeks, with the foot of the bed elevated ten to twelve inches. By thus overcoming intestinal drag and abnormal bowel kinks, stasis theoretically is lessened. In fact, many of these cases treated thus are less constipated than when leading an ambulatory life. In addition, gradually increasing exercises are outlined, the object of which is to increase the muscular tone of the lower abdominal wall to expand the upper abdomen and to contract the lower.

Postfeeding distress is commonly relieved by turning the patient on the right side or abdomen for one hour after each meal, often happily combined with the application to the abdomen of local heat. Cathartics are avoided, except where necessary and then a weekly saline may be given and a daily evacuation of the colon obtained by glycerine suppository or small saline enema. Hardened stool may be softened by a retained injection over night of four to six ounces of cottonseed oil. A properly fitting and specially designed belt is furnished at the end of the bed period, this to be laced in place in the Trendelenburg position.

The above routine is continued for several months with the addition of gradually increasing walking exercises to the extent of four to five miles a day. Patients are cautioned that symptoms are apt to recur with any marked loss in weight or relaxation in application of the treatment.

The whole problem is essentially a medical one, although certain associated factors require surgical interference, if the results of medical treatment are unsatisfactory. We do not feel that duodenojejunostomy is the solution, except where possibly at operation one finds it impossible to adequately release distorting periduodenal bands, membranes or adhesions. We prefer in most cases to relieve the intestinal drag which is the primary cause by cecal plication and fixation, where the cecum is large, boggy and ptosed, and in addition if necessary to do a colopexy after first restoring the anatomy by proper severing of distorting bands.

Of our series of thirty-six cases under observation at the present time, six are children of the so-called *cyclic vomiting* type. Two adults have come to operation, neither of whom responded to the medical regime. In one, a young man of twenty-one, a cecopexy and colopexy were performed. At operation on the other, a woman of twenty-five, was found a dense, fibrous band holding the hepatic flexure down to the ileocecal region. This was severed before the normal anatomy could be restored and the operation completed by doing a cecopexy and colopexy. The results of both operations after twelve to fifteen months respectively are decidedly favorable, both being back at work and complaining of no symptoms.

CASE REPORTS

Case 1 (figs. 1, 2, 3). Female, 40, sick headache all her life, "even as a girl." When first seen the present attack had lasted for one month, vomiting almost daily, practically bedridden, marked loss of weight and being fed alkalies. Previous roentgenogram at large clinic was negative. We insisted that that patient be brought to the office *during the attack.*

Fig. 1. Note the dilated duodenum with no barium passing into the jejunum. This film was taken at end of 2½ hours. Fluoroscopic examination during this period showed marked writhing or churning movement of the barium in the duodenum. The foot of the bed was then raised with patient on her abdomen. Observation at end of two hours more showed stomach and duodenum entirely empty (see fig. 2).

Fig. 2. Taken after five weeks medical treatment, during which patient gained 30 lbs. in weight. Her vomiting stopped after first day of treatment. The barium passes immediately through duodenum. Had this been the first examination of the patient, what would the diagnosis have been? (see fig. 3).

Fig. 3. Taken after ten months with patient beginning to lose weight through overwork, worry, etc. The entire duodenum is seen on print and marked churning movement seen fluoroscopically. Barium at intervals passes into jejunum. The condition here is not so marked as in fig. 1. We cannot conceive of the intermittent obstruction here being due to other than a pure arteriomesenteric drag. The clinical history with the abnormal mobility of cecum and ascending colon which this patient had should make the diagnosis, no matter at what stage the examination was made.

The diverticulum in the duodenum is of no significance here. Is it, however, due to the intraduodenal tension present in these cases? (See also figs. 31, 34, 44).

Case 2 (figs. 4, 5, 6, 7). Fig. 4. Female, 38. Since four years of age, periodical attacks of vomiting with headache. Present attack once a day for two weeks. This film was taken forty-five minutes after taking barium, the entire amount of barium having passed into the jejunum in that time, as seen on print in "jejunum" (see fig. 5).

Fig. 5. Taken after two weeks in bed and no improvement in symptoms. This film was taken prone (see fig. 6).

Fig. 6. Taken at same examination as fig. 5, with patient upright during fluoroscopic examination. Unless the behavior of the duodenum is observed fluoroscopically with the patient upright, many cases will be missed. This patient has also a high, fixed, immobile hepatic flexure. The duodenal dilatation is readily seen in prints.

X-ray diagnosis: Duodenal stenosis due to abnormal bands, probably hepatoduodenal colic.

Fig. 7. Still same patient taken at end of five weeks and but little improvement clinically. Nothing is now in the duodenum to suggest the diagnosis quite evident in the preceding three films. Operation is here advised.

Case 3 (fig. 8). Male, 64. Severe attacks of left-sided pain with vomiting for many years. Present attack is severe. Is losing weight. Clinical diagnosis: Carcinoma of the stomach. X-ray diagnosis: Stomach and bulb normal, marked duodenal dilatation with stasis. Patient examined in upright position. Note gloved hand to push stomach out of the way. Not operated on.

Case 4 (fig. 9). Female, 31. Nine months search at largest medical centers for relief from "migraine." Symptoms lasting ten years. Severe headaches with nausea and vomiting. Stomach pushed aside by ungloved hand to show dilated duodenum. In addition patient had a hugely dilated mobile pelvic cecum. Medical treatment here is resulting in some slight improvement.

Case 5 (fig. 10). Female, 21. Epigastric pain with vomiting and right-sided headaches every two weeks for one year. Dilatation of duodenum evident. Not followed up to determine mobility of cecum. Surgical treatment not advised.

Case 6 (figs. 11 and 12). Boy, 12. Attacks of *cyclic vomiting* several times a year since age of eight. Attacks may last a week or more and are quite incapacitating. For past year has pain characteristic of duodenal ulcer. An appendectomy six months prior to this examination gave no relief from the vomiting spells. Note the duodenal ulcer with pouching just beyond and the dilated duodenum, the latter seen only in the upright position, not when prone. Adhesions from the ulcer may be the cause of the duodenal pouching but not of the dilated duodenum which we believe here is primary and has been the cause of his *cyclic vomiting* spells.

Case 7 (fig. 13). Male, 36. Dilatation of the duodenum here due to adhesions from a perforating gastric ulcer, tip of which is seen on lesser curvature. Cases such as this and those due to adhesions to duodenum from infiltrating extrinsic growths are not uncommon and are not being considered in this paper.

Case 8 (fig. 14). Male, 31. Duration of symptoms five years. Fig. 16, case 10, male 36, duration of symptoms 10 years; fig. 22, case 14, male 42, duration of symptoms 20 years, as well as figs. 11 and 12, case 6, already described, show the dilatation of the duodenum often accompanying a duodenal ulcer.

Such a combination is too frequent to be more than a coincidence and suggests the following queries: Is the dilatation primary? Do such cases do badly under treatment with alkalies owing to tendency to alkalosis in high intestinal stasis? Do such cases do badly with a gastroenterostomy, if the dilatation is overlooked? The large series of such cases of Dr. Sloan[22] of Bloomington, reporting cure of the ulcer by performing duodenojejunostomy

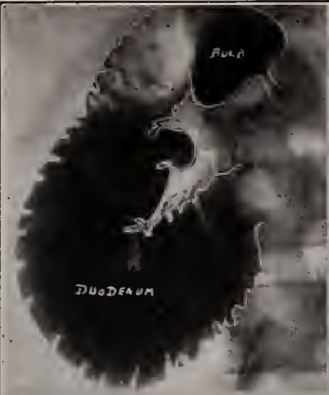


FIG. 1

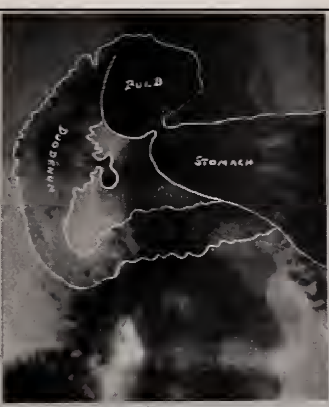


FIG 2

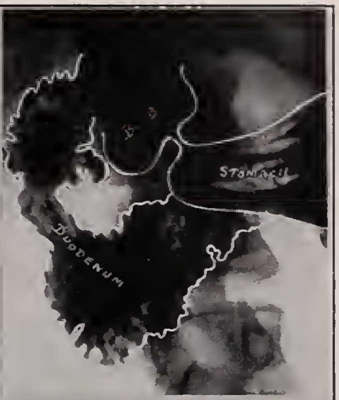


FIG 3

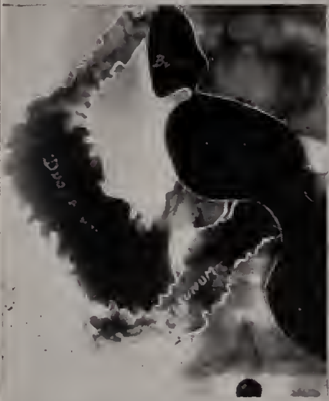
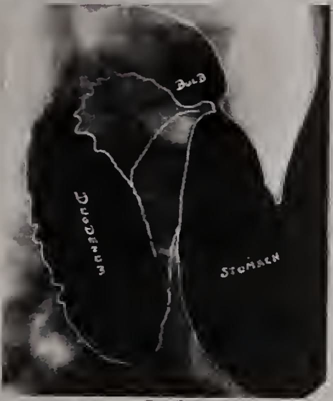


FIG 4



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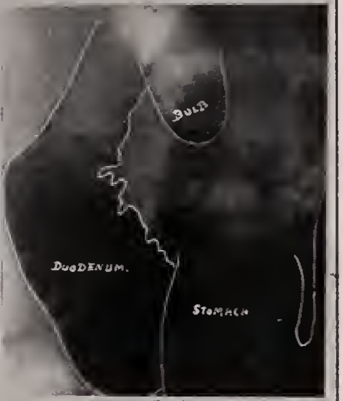
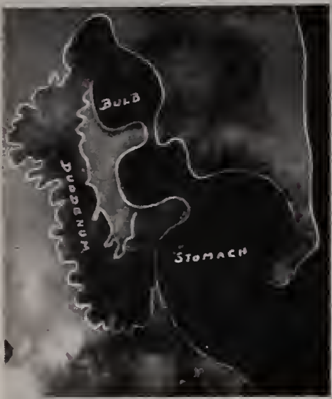


FIG. 6



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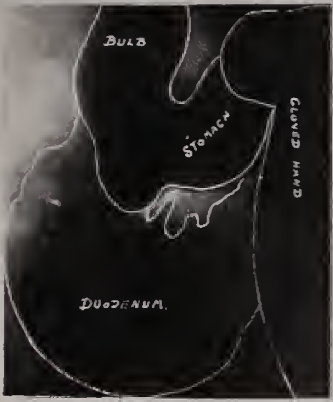


FIG 8

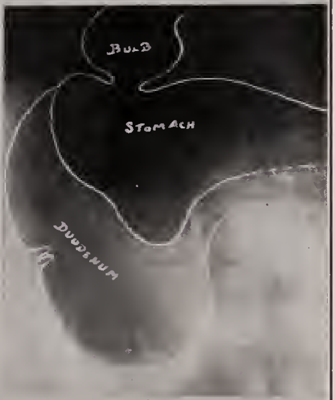


FIG 9

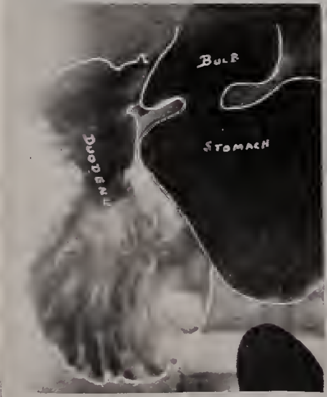


FIG 10

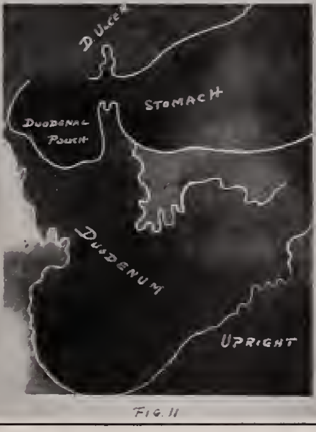


FIG. 11

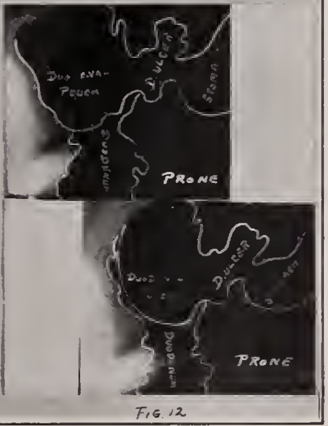


FIG. 12

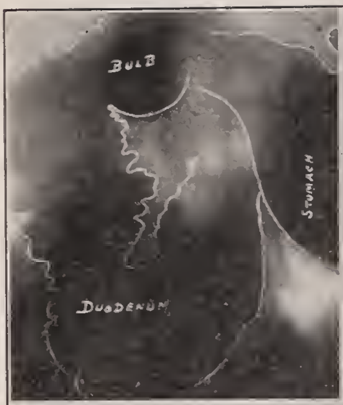


Fig 13

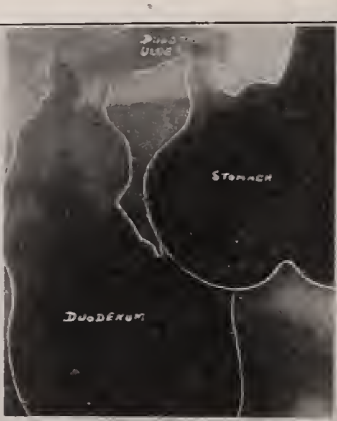


Fig 14

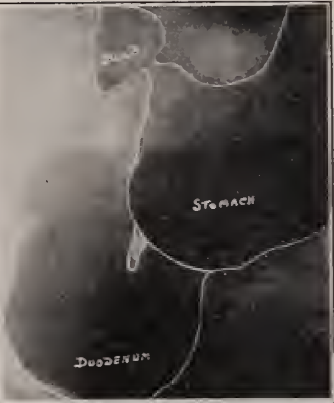


Fig 15

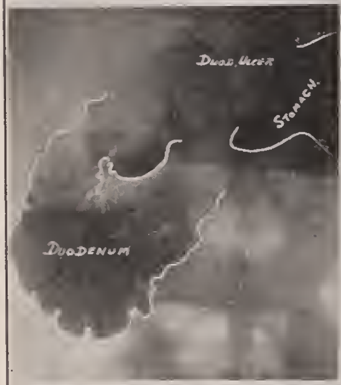


Fig 16

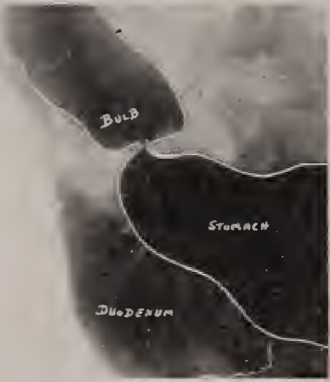


Fig 7

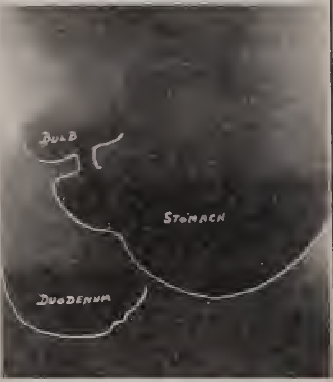


Fig 8

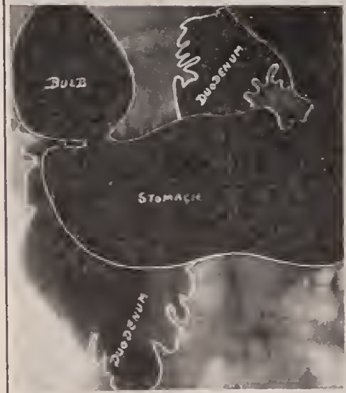


Fig 19

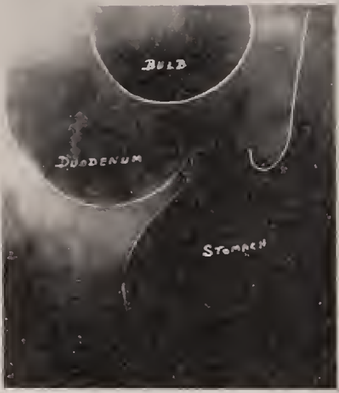


Fig 20

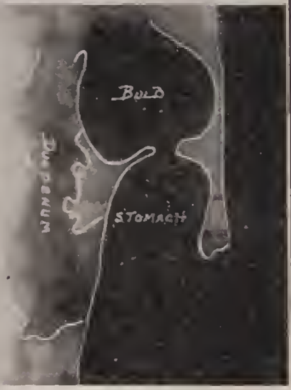


Fig 2

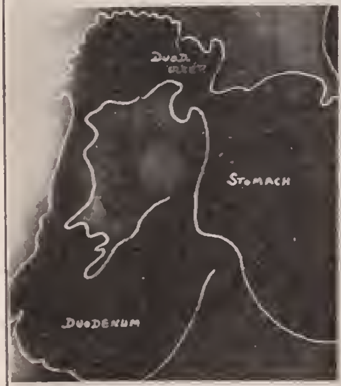


Fig 22

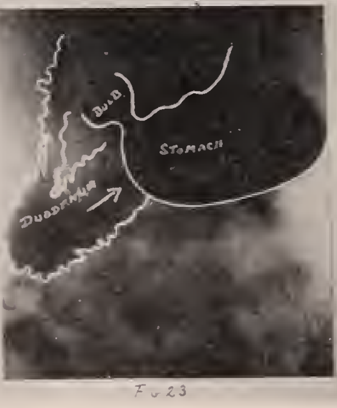


Fig 23

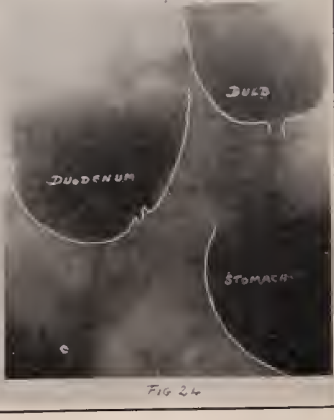


Fig 24

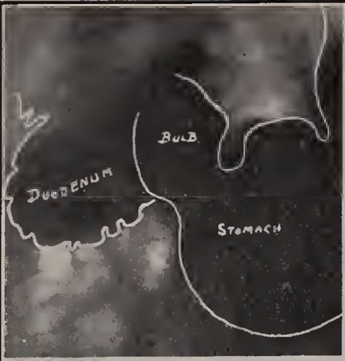


FIG 25

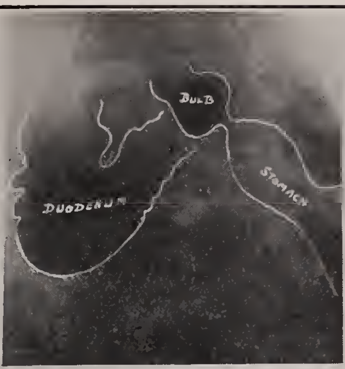


FIG 26

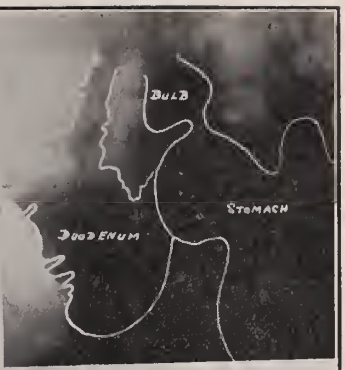


FIG 27

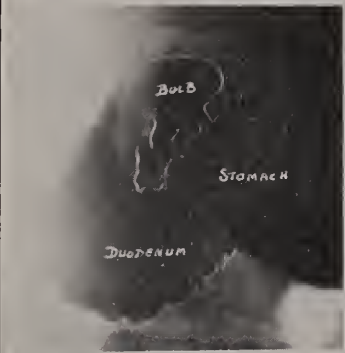


FIG 28

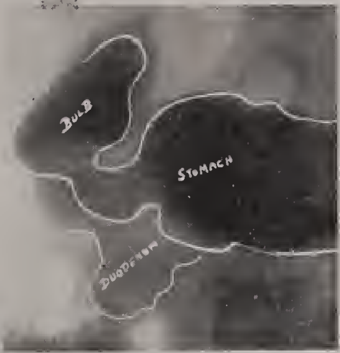


FIG 29

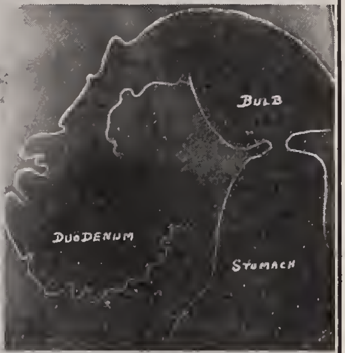


FIG 30

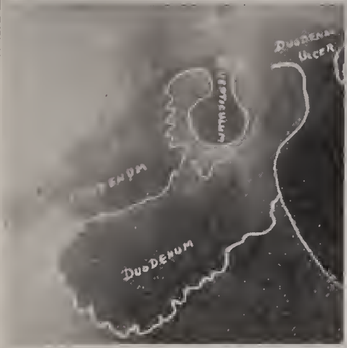


FIG 31

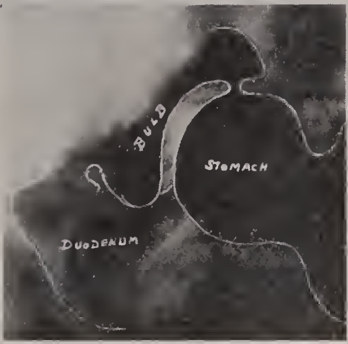


FIG 32

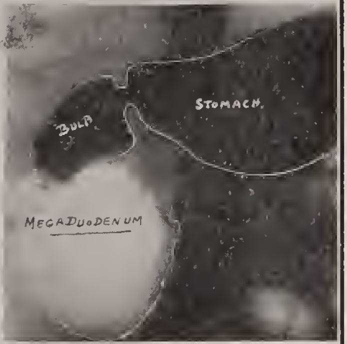


FIG 33

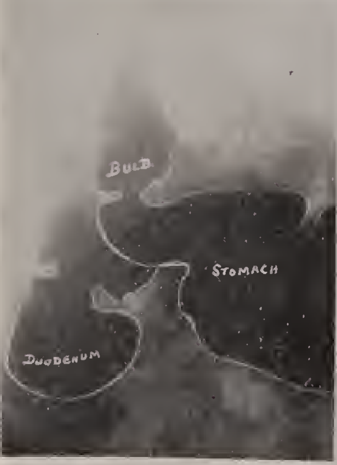


FIG 34

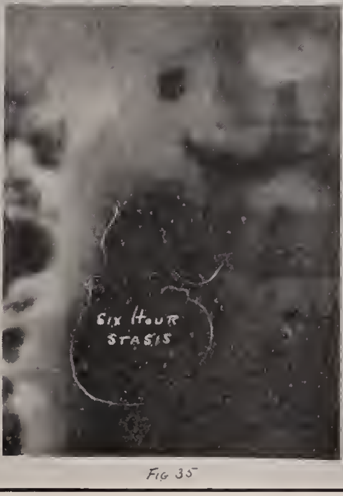
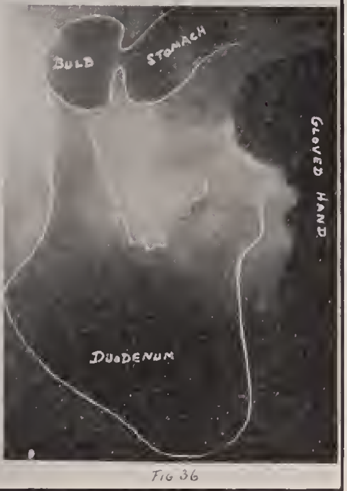


FIG 35



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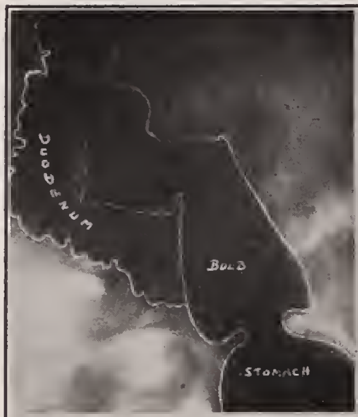


Fig 37

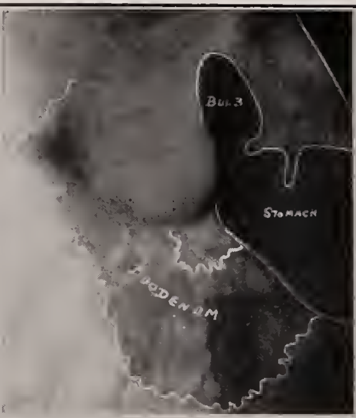


Fig 38

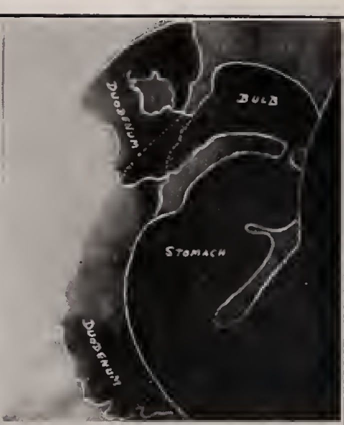
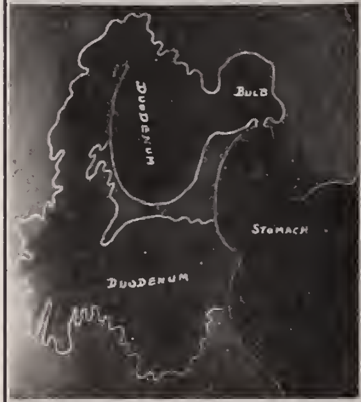


Fig 39



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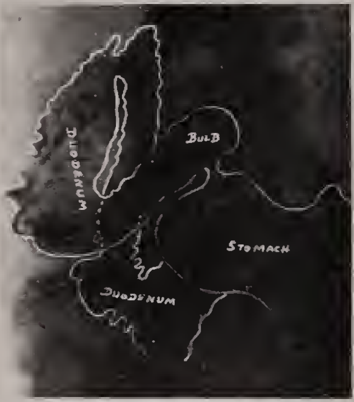

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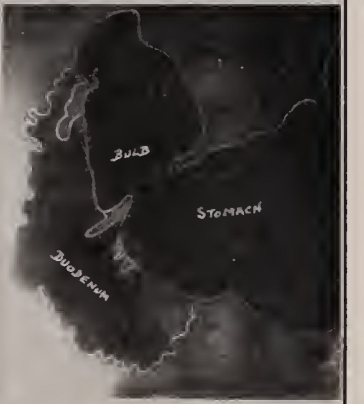

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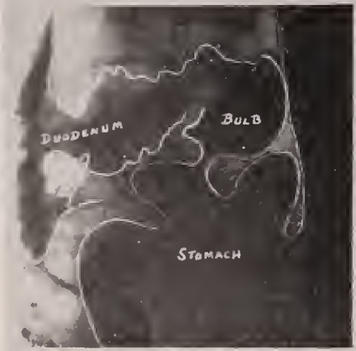

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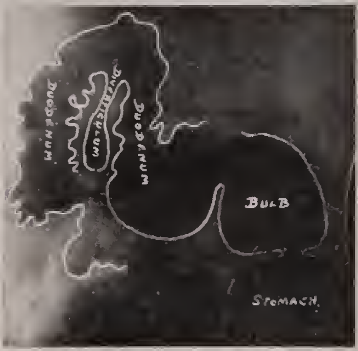

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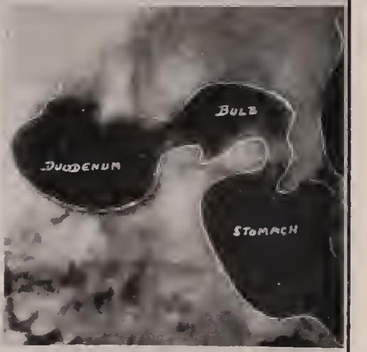

Fig 45

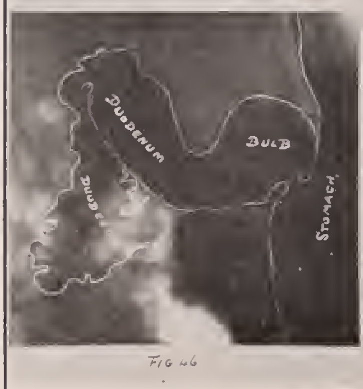

Fig 46

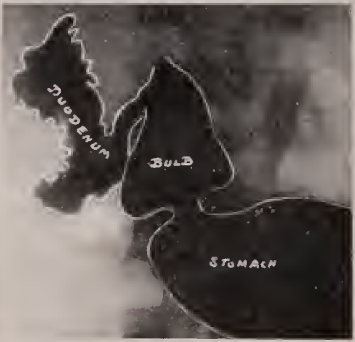

Fig 47

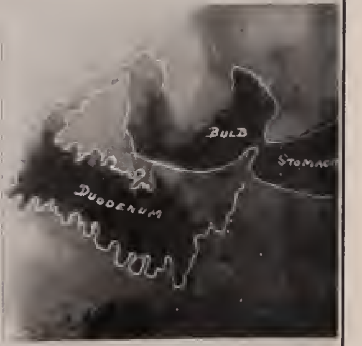

Fig 48

for the dilated duodenum, is worthy of serious consideration.

Case 9 (fig. 15). Male, 28. Attacks of epigastric distress with nausea and vomiting for four years. Clinical diagnosis: Duodenal ulcer. X-ray diagnosis: Evident from print. Operative diagnosis: Adhesions at duodenojejunal junction from inflammatory mesenteric glands.

Case 11 (figs. 17 and 18). Female, 37. Little or no history obtained here. Severe attacks of gastric distress warranting operation. Fig. 17, taken prone, shows the dilated duodenum.

Fig. 18, taken upright after three hours, shows the stasis or puddling in the duodenum.

Operative diagnosis: Adhesions of liver and duodenum, causing dilatation.

Case 12 (fig. 19). Female, 47. For twenty years constipation, nausea, headaches, vomiting frequently. Clinical diagnosis: Asthenia, migraine. X-ray diagnosis: Intermittent stenosis, due to anomalous bands. Note entire duodenum seen at one time. Operative diagnosis: Duodenum two and a half times its size, due to abnormal bands.

Case 13 (fig. 20). Female, 29. For over one year severe headaches with vomiting of bile. Losing weight. Vomiting fluids taken the night before. Headaches now practically constant. Clinical diagnosis not made. X-ray diagnosis: Duodenal dilatation with stasis. Operative diagnosis: Dilated duodenum, for which a duodenojejunostomy was performed.

Case 13 (fig. 21). Same case as preceding, taken at same time but with patient prone, showing a normal duodenum. Hence necessity for observing such patients in the upright position and fluoroscopically.

Case 15 (fig. 23). Little girl, 8. So-called "cyclic" attacks of vomiting. This case is shown here as we are convinced that such attacks in children come under this class of intermittent duodenal stenosis. In six cases under observation at present we find the same anomalies in the intestinal tract as described in this paper. Colon redundancies or other anomalies than those described here are coincidental. The removal of the appendix is not the solution of the problem. Note in the many histories of adults here reported the number dating their attacks back to childhood.

Case 16 (fig. 24). Female, 30. This is to show the duodenal stasis of a true gastroptosis with its own train of symptoms. This statement is made while quite mindful of the excellent work of Moody, Van Nuys, Chamberlain, Wingate Todd and others. Gastroptosis per se is no factor in the types this paper is concerned with.

Cases 17, 18, 19 (figs. 25, 26, 27). These three cases are clinically as characteristic cases of duodenal stenosis as case 1. Cases 17 and 18 had just as severe attacks. All have mobile ceca. Examination was made in the interval between attacks. The dilatation of the duodenum, as can be seen, is not very marked. Fluoroscopic observation shows the same to and fro churning movement in the duodenum. We have no hesitation as to the diagnosis to make in these three cases.

Case 20 (fig. 28). Female, 15. Nausea and vomiting every morning for three months. Considerable loss of weight. X-ray diagnosis evident from film. Operation being considered.

Case 21 (fig. 29). Male, 47. Recurrent headache all of life. May last from twelve hours to three days, completely incapacitating patient from a very responsible position. Diagnosis made fluoroscopically with patient upright. No diagnosis possible from this film taken prone. Duodenojejunostomy performed. In this case at least, judging from the almost complete relief for two years, this type of operation seems to have justified itself.

Case 22 (fig. 30). Female, 32. Characteristic history. Diagnosis of dilated duodenum made elsewhere and operation advised. At this examination, made in the interval, the dilatation is not marked, while if made during an attack, it may be as marked as in fig. 1, case 1.

Case 23 (fig. 31). Male, 22. Severe spells of abdominal cramps and nausea since eight years of age. At present the history is suggestive of duodenal ulcer.

X-ray diagnosis: Duodenal ulcer (fluoroscopic diagnosis); duodenal diverticulum; and the unusual "cup and spill" type of descending duodenum due, no doubt, to constricting bands. Is the latter abnormality the cause of the symptoms dating to childhood as also of the duodenal ulcer present now, and of the diverticulum owing to intraduodenal tension present in such cases?

Case 24 (fig. 32). Female, 44. Stomach distress for first time six months ago. For past three months vomiting one hour after every meal. Occasional sick headaches and loss of weight.

Clinical diagnosis: Cancer of stomach. Request to x-ray department was to rule out cancer of stomach. X-ray diagnosis: Stomach and bulb normal. The dilated duodenum was overlooked.

After rest in bed in hospital the symptoms disappeared and clinical diagnosis was then revised to read hyperacidity and gastric neurosis. After return home vomiting started again and condition warranted an exploratory operation which revealed a very much enlarged duodenum, for which duodenojejunostomy was performed.

This was the first case seen by the writer of this condition and started the investigation of which this paper is the result. Looking at figure 32 now, one would not overlook at least the evidence of a much dilated bulb.

Case 25 (fig. 33). Megaduodenum in a child three and one-half years old. Symptoms justified clinical diagnosis of pyloric stenosis. Operation revealed a hugely dilated duodenum, due to obstructive bands in region of ligament of Treitz. Complete relief from duodenojejunostomy.

Case 26 (fig. 34). Male, 34. Headache and stomach trouble for fifteen years. Headache not relieved until patient vomits. May vomit every five minutes for three or four hours. Dizzy spells. Constipated. Note large pouch at knee of duodenum. This held traces of barium for twenty-four hours. Operation advised but refused as a previous appendectomy was to have cured.

Case 26 (fig. 35). Same case as preceding, showing six hour stasis in duodenal pouch and evidently the cause of the toxic symptoms.

Case 27 (fig. 36). Male, 51. For many years severe bilious attacks. Headaches now lessening but severe vomiting spells occasionally. Dizzy, dopey, below par. All kinds of diagnoses, one contradicting the other, had been made. Is the duodenum pictured here, plus a mobile cecum, the cause?

Cases 28 to 39 (figs. 37 to 48). Show the various distortions of duodenum due to anomalous bands. The question will always be raised here as to whether a pathologic gallbladder, with resulting adhesions, is not the cause. The cases represented by figs. 42, 44, 48 date their symptoms from childhood. The symptoms in all, except three, were characteristic of the cases heretofore described and in which, of the many operated upon, a normal gallbladder was reported. While the gallbladder in this latter group of cases may well show pathology, it is in our opinion secondary to the intermittent stenosis usually of long duration, due to abnormal bands.

Figure 38 is to show the distortion from a proven pathologic gallbladder with stones.

Figure 45 had, at least macroscopically, a normal gallbladder.

These two were the only ones of this group operated upon.

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GASTROINTESTINAL SYMPTOMS FROM LESIONS OF THE URINARY TRACT *

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It is a common practice, possibly we may even call it a fault, for the doctor who practices a specialty to examine his cases from the standpoint of his specialty. In so doing it stands to reason he will find conditions that fall within his limitations more often than the general practitioner, though he has been accused, not without reason, of overlooking other conditions which the general man would have recognized. This preliminary, lest we forget the beam in our own eye, when calling attention to the mote in our neighbor's.

The gastrointestinal system, occupying most of the abdominal cavity, is the seat of many of the ills of humanity. Because it is so extensive, it is naturally the first to be suspected of pathologic conditions when we discover pain and other symptoms obviously in the abdomen. I would venture a guess that ninety-nine out of a hundred of us, called to see a case of abdominal pain, with nausea, constipation or diarrhea, would at once assume that it was a gastrointestinal condition, and that diagnosis simply involved discovering what part of the alimentary tract was at fault.

The patient himself seems to stress his gastrointestinal symptoms to the exclusion of those which are frankly from the urinary tract, so that in listening to the story of his trouble, he will dwell on the nausea, bowel irregularity, loss of appetite and gas distress, but the fact that he has also frequency, dysuria, etc., is often not mentioned until the doctor questions him regarding these symptoms. Then he admits having them, even for a long time, but they have not impressed him as being connected with his present illness. Because we are so prone to overlook the urinary tract as a cause of abdominal symptoms is the reason for this paper.

Hinman, Braasch, Cabot, Stirling and others have reported from 30 per cent upward of ureteral stone cases previously having been operated upon without relief.

Abstracting from an article by Stirling, "The following case illustrates the frequency with which renal calculi are mistaken for abdominal conditions:

"Male 45, entered hospital complaining of distress in the epigastrium and inability to assimilate solid foods. Some dysuria and nocturia were noticed.

"Past history: Patient had gastroenterostomy for a supposed gastric ulcer several years previously without relief. He subsisted entirely on ice cream and other soft foods. A routine roentgenogram showed a large indefinite shadow in the region of the right kidney. A cystoscopy and pyelogram were done and a thalein test made. The affected kidney function was almost normal, so a pyelotomy was done and the stone removed. The relief following this operation was very marked. Previous to this operation the patient weighed 102 pounds; following the operation he was able to resume his regular diet, eating solid foods as desired, and gained twenty pounds within a short time. The patient refused to have the accompanying renal infection cleared following the operation and had to have two secondary kidney operations later for the removal of stones which reformed within a few months time in each instance."

The foregoing case illustrates well the necessity of cleaning up kidney infections after the stone is out, to prevent recurrence. In all renal infections distant foci should also be cleaned up, particularly in cases of calculi. As a primary and common cause of kidney infection furunculosis ranks well up on the list.

In a recent publication Damon Brown writes: "Attacks of abdominal pain, associated with nausea, vomiting, not infrequently diarrhea, and any urinary disturbance, dysuria, anuria, frequency, should always be sufficient indication for a study of the urinary tract. Pyuria and hematuria, even though slight, would be helpful diagnostic aids. A sketch of the literature would indicate that most of the reported cases had presented symptoms from a few months to several years and, because of the gastrointestinal manifestations of trouble, diagnostic and therapeutic measures had been directed to that part of the body to the total exclusion of the urinary tract. There still seems to be present among men

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* Read before Pierce County Medical Society, Tacoma, Wash., Oct. 11, 1927.

in general work an astounding disregard for disorders of the urinary tract."

Quoting again, from Barry, writing on ureteral stricture, who says, "A proper appreciation of this lesion by the general practitioner will clear up many otherwise obscure abdominal conditions; will save numerous needless and mutilating operations; will eliminate a large proportion of recurrent pyelitis, pyonephrosis and stone, and will conserve many kidneys. The true cause of many chronically inflamed appendices is to be found in the ureter. The average general practitioner, if he keeps this condition in mind, can make a tentative diagnosis in most cases, thereby decreasing his otherwise increasing group of so-called neurotics."

Livermore says, "Infections of the urinary tract are often neglected or passed over with such scant examination that irreparable harm is done before the patient comes to the urologist. When a patient has pus in the urine, with or without symptoms of cystitis, and is having a daily rise of temperature or a chill followed by fever, the infection has involved the kidneys."

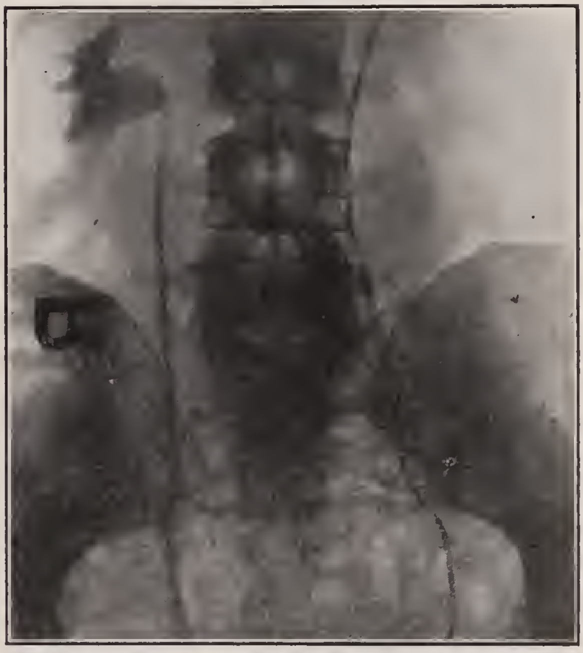
It is not unusual for a doctor to be called to see a child, and be told that the patient has no appetite, is languid, seems definitely sick, but who on examination shows no signs of disease except a fever. Next day without treatment the temperature has become normal, the patient seems well and nothing further is done. Some months later, however, this same child is seen again with a history of not being quite itself, not gaining weight as it should, and the mother says "its kidneys are weak" because it urinates frequently. At this time a renal lesion is diagnosed, which has become chronic and stubborn, and which would have been quite apparent at the time of the doctor's original visit, had search been made for it then.

Children are subject to the same urinary diseases that are found in adults, even stone having been found in infants as young as ten months of age. They are also capable of being cystoscoped, having the kidney pelvis lavaged, and generally treated the same as adults. Young remarks, however, "Unfortunately, these methods are rarely called into use and much propaganda is desirable to prove to clinicians the availability and simplicity of these important diagnostic methods."

Nephroptosis in women is quite common, the right kidney, as shown by Mathe, being especially liable to prolapse, the supporting fasciæ on the right side affording a less secure anchorage than on the left.

To illustrate some of the foregoing points, I wish to submit three cases from my own experience, in which the presenting symptoms were gastrointestinal and in which pyelographic diagnosis and subsequent treatment demonstrated conclusively that the lesions were entirely in the urinary tract.

Case 1. L. H., female, 29, single. August 12, 1926. Symptoms, nausea, a "sickish gnawing" in epigastrium three or four hours after eating and during the night. Some gas eructations after meals. Gradually getting worse the last two years. Severe abdominal cramps and single copious vomit twice in last six months. Frequent diarrhea, and regularly three loose bowel movements a day. Anorexia, breakfast being her only good meal.



Case 1. Renal ptosis, hydronephrosis and stricture of ureter.

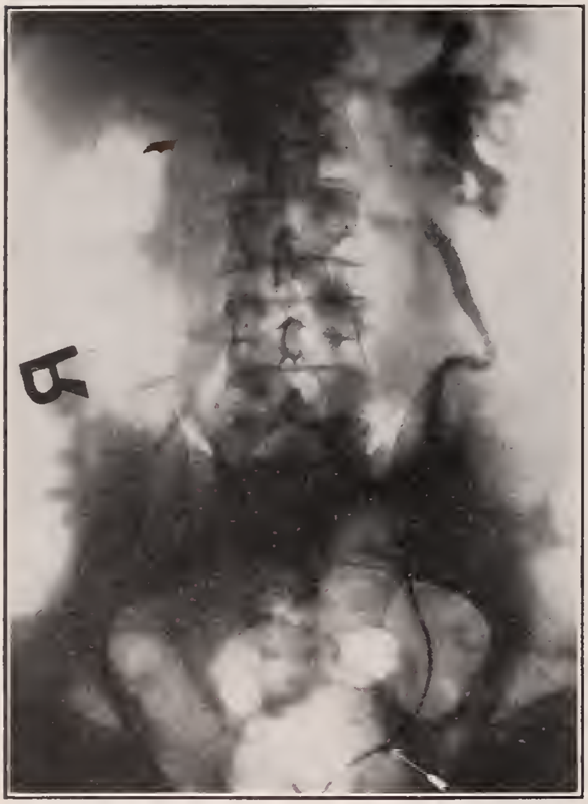
Examination revealed some tenderness at McBurney's point, but no tenderness or other signs of gallbladder or pyloric pathology. Diagnosis of chronic appendicitis being made, she was advised to have an appendectomy, and in the meantime was given powders of soda and megnesium which she took for a month, with improvement in the symptoms while taking the powders and a return of all her troubles every time she stopped.

Nov. 12. Cystoscopy and right pyelogram. The film showed nephroptosis, right angled kink of ureter, and pelvic dilatation, a beginning hydronephrosis. The irregular ureteral outline may be due to peristalsis, but as there was considerable resistance to the passage of the catheter, partial ureteral stricture was included in the diagnosis. Treatment consisted in dilating the ureter and supplying a belt with kidney pad. The symptoms cleared up entirely in two weeks, and she has been well since.

Case 2. E. R., male, 60. May 29, 1927.

Symptoms, anorexia, nausea, continuous distress in stomach with belching of gas, also much gas per rectum. Habitual constipation, very marked the last four days, in spite of enemas and cathartics. Abdominal pain getting worse daily, accentuated by straining at stool. Frequency of urination which is not unusual for him.

Examination: Temp. 99°, pulse 80, B.p. 110-70, W. b. c. 8500. No abdominal rigidity, very marked tenderness over left kidney and along course of ureter. Roentgenogram shows small shadow, possibly calculus in ureter. Cystoscopy reveals beginning trabeculation of bladder base, small papilloma at right posterior margin of vesicle neck. No. 6 catheter goes easily into right ureter; smallest catheter meets obstruction 3 cm. up in left ureter. Normal appearing urine from right ureter, none from left. After some difficulty, a No. 4 catheter is passed 10 or 12 cm. up left ureter, and as the obstruction is passed, there is a forceful discharge of a black fluid from the ureter into the bladder, and the same kind of fluid comes from the open end of the catheter. This proves to be disintegrated blood and urine. Patient says that relieves his pain somewhat.



Case 2. Arrow points to ureteral calculus.

Pyelogram shows dilated, kinked ureter, ureteropelvic junction obliterated, suggesting papilloma; other kidney outlines blurred, doubtless due to blood clots in kidney. Catheter was allowed to remain in ureter, but came out during the night and patient's pain increased.

Next day cystoscoped again. Left ureteral orifice now pouting, ridge red and swollen. Stone within 1 cm. of bladder. Attempt made to remove, but orifice too small. Orifice enlarged on upper end with diathermy incision about 1 cm.

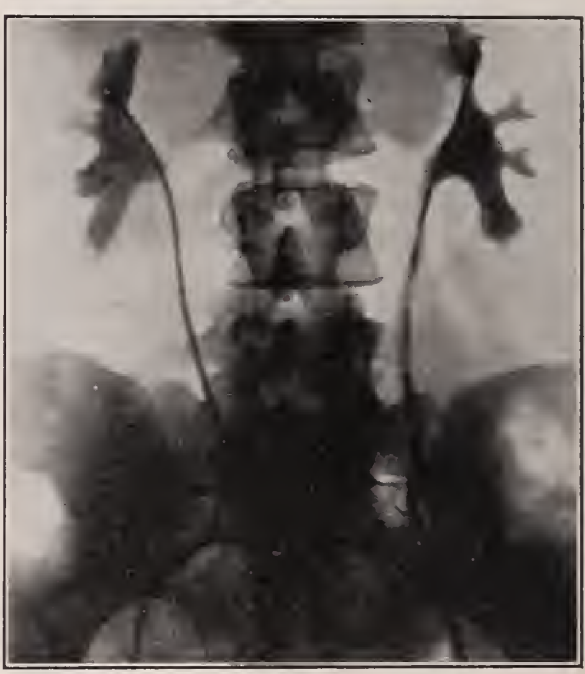
Six hours later patient had severe chill, twenty minutes sharp pain, and rushed into lavatory to urinate. Complete relief from pain followed. The black color gradually disappeared from urine. Two weeks later, in spite of internal medication, the urine still being cloudy with pus, lavage of the left kidney was done. Two days later, the urine appearing crystal-clear, he refused further treatment, although the urine from left kidney showed pus 2.

Kindly note in these films the characteristic gas-filled intestines, demonstrating that the gastrointestinal symptoms are reflex and not purely psychologic.

Case 3. N. S., female, 30. July 4, 1927. Appendectomy and ovarian tumors two years ago.

Symptoms: Has to lie down because she is nauseated in the erect position. Eructations of gas, pain a good deal of the time lately, made much worse by motoring trip today. Pain always in right abdomen, dull ache, not acute. Anorexia; cannot bear the sight of food. Passes considerable gas per rectum, but constipated. Frequency at times. Temperature normal.

Examination: Sensitive to pressure in costovertebral angle and along course of ureter, right side. Pressure along ureter produces the typical pain she has been feeling.



Case 3. Compare clean cut outlines of left kidney with blurred outlines of right.

Cystoscopy: Trigonitis, small ulcer right trigone. No. 6 catheters pass readily 20 cm. Left easily, right with some hang. Right urine excreted three times the quantity of left. Right urine contains flocculi composed entirely of pus cells. Both urines show B. coli in culture.

Pyelogram: Left normal, clean cut cups at ends of calyces. Right, outlines blurred, due to inflammatory changes. Treatment by lavage of right kidney pelvis and injections to bladder improved the condition at once.

SUMMARY

1. Because the symptoms seem definitely gastrointestinal, in many cases the urinary system is not carefully examined.

2. The urinary system frequently causes symptoms similar to those caused by the alimentary tract.

3. It is desirable to direct clinicians' attention to these facts, that better urologic studies may decrease the number of erroneous diagnoses.

PULMONARY TUBERCULOSIS

SOME POINTS IN ITS TREATMENT*

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I wish to touch upon a few of the points in the treatment of tuberculosis which have impressed me as being of especial importance from the practical side of the work. We are still hoping that in the not too distant future a specific cure for this disease will be discovered. Until that time we must continue to carry out our work along empirical lines.

During the past few years considerable advance has been made both in the diagnosis and the treatment of tuberculosis. This advance, which was stimulated to a large extent by the late war, has come about, first, because many more men have gone into tuberculosis as a specialty; second, because the men in general work have become more interested in tuberculosis and are better able to cope with the disease. Consequently, the mortality from this disease has shown a marked decrease during the more recent years.

Our therapeutic armamentarium, as we ordinarily think of it, includes rest, graduated exercise, food, pure fresh air and favorable climatic conditions, the importance of these factors perhaps being in the order named. However, the more I see of tuberculosis and the more I watch the results of treatment, the more I realize that our ability to cure it lies, for the most part, in our ability to control the mental attitude of the patient. Unless we are able more or less completely to direct our patient's mental processes, we are unable to apply the other phases of the treatment in such a way as to accomplish the desired result. There are a certain number of patients whose mental attitude we are unable to explain or control. The mortality among this class of cases is large, regardless of whether they come to us early or late in their disease. On the other hand, the patients who cooperate with us mentally as well as physically show a relatively high percentage of recoveries, even those in the most advanced stages.

In my first interview with the patient in whom the diagnosis has been made, I endeavor to study three things in particular, first, his mental attitude toward the idea that he has tuberculosis; second, the type of disease and the resistance manifested by the host, that is the patient's physical reaction; and, lastly, the extent of involvement. I tell him that the prognosis depends primarily upon his mental attitude, that is, his determination, will-power and self-control; to a less extent upon his physical reaction, and least, in most cases, at any rate, on the extent of involvement.

With the idea of starting the patient upon the right mental course, the first step in the treatment of tuberculosis is to explain clearly and frankly to him the nature and the extent of his disease, as well as the nature of the treatment, making it clear that it is a long course. The truth in regard to the patient's actual condition at times may be a great shock to him, but I have found that in practically all cases in the end they appreciate the truth regarding their condition, and as a result always make better patients. If from the beginning we explain the truth to the patient, making exception of those whom we think hopelessly sick, putting it up to them in a cheerful and optimistic way, we have made a beginning of establishing that bond of confidence which should exist between patient and physician, a confidence which can be maintained only when the patient feels that we always tell him the truth. Patients who do not have the will-power to face the truth, if it is told to them in an optimistic way, do not have the will-power and determination to get well of tuberculosis.

Frequently friends or relatives request the physician not to tell the patient that he has tuberculosis. The character of the treatment makes this very impractical. The carrying out of the necessary details requires an enthusiastic cooperation on the part of the patient. When an attempt is made to keep him in ignorance of his condition, such cooperation will be lacking. The patient should be made to understand that perhaps there will be many ups and downs, but that the individual who can face these with fortitude, and follow the course laid out for him, is the one most likely to recover his health.

An effort should be made by the physician to place the patient in the best possible surroundings which are compatible with his circumstances. We are all more or less products of environment, and this applies with especial force to those sick with tuberculosis. The poisons of this disease appear to affect the centers of nerve control in such a way that the whole system is thrown into a state of unstable equilibrium. Events which would pass unnoticed when well are of serious moment to an individual when he has tuberculosis. The psychic state in turn exerts a powerful influence on the physiologic activities of the body.

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* Read before the Santa Barbara County Medical Association, Santa Barbara, Calif.,

Dr. George Crile says, "Emotions drive the organism with extreme intensity; emotions may cause exhaustion or they may cause shock." He further adds that, "at autopsy definite changes in tissues such as the brain, liver and other organs are found which are due entirely to the effects of the emotions." We have seen the spread of christian science and the doctrines of various other cults which owe their influences solely to the power of the mind over the functions of the body. Every physician, as you know, uses this influence to a greater or less extent in his daily practice. He, however, calls it by its right name and assigns it to its proper place.

A patient should understand that in order to adjust himself to the treatment of tuberculosis, he must discipline himself to do a great many things that are contrary to his inclinations. He must give up his old ways of doing and live according to an entirely new sets of habits of doing and thinking for the time being. His surroundings should be such as will aid him, as far as possible, in the adjustment of his mental condition to his new life.

A properly organized sanatorium aims to create an atmosphere that will aid the patient, as far as possible, in this phase of the cure. Such a sanatorium is a training school in which the patient is helped by the moral support and the mutual sympathy of his fellow patients, and by the skilled supervision of his attendants, to properly discipline himself. Patients who begin the cure in a sanatorium should remain sufficiently long so that the routine habits necessary in the cure become so fixed that when they return home, or to their family physicians, these habits may be carried out without any great conscious effort.

If patients are to take the cure at home, an effort should be made to develop such homes into miniature sanatoria. Provision must be made for the control of disturbing influences, such as the number and character of visitors and the elimination of the deleterious effects of the injudicious sympathy of overanxious and loving but untrained friends and relatives. However, to instruct the relatives in the details necessary for the successful carrying out of the treatment in the home is in most cases a hard task.

To recapitulate, rest, graduated exercise, food, pure fresh air and favorable climatic conditions are the fundamental physical factors in the treatment of tuberculosis. The patient's mental reactions determine for the most part the measure of benefit received from these factors. Environment and the attitude of his attendants determine largely these mental reactions.

In order to intelligently apply the physical factors of rest, graduated exercise, food, fresh air and climate, we must have in mind a clear idea of the relation each of these bears toward the disease. Rest for one sick with tuberculosis is an entirely different thing than for the healthy person. Rest for the tuberculous patient means twenty-four hours out of each day in bed, mentally, emotionally and physically relaxed, unless otherwsie prescribed by the physician. Rest, as the term is used in the treatment of tuberculosis in the active stage, involves the reduction to a minimum of the muscular activity, mental exertion, psychic relations and all cellular activity, except that directly concerned in fighting the disease.

Any form of activity on the part of the body, physical, mental or emotional, requires energy. This energy is gained at the expense of certain body cells. To replace these cells an extra amount of food is required. This extra amount of food creates an unnecessary demand upon the organs of digestion and elimination, and upon the lungs and heart. Rest, then, by conserving the body tissues, conserves the body energy. This energy is an important factor in maintaining or reestablishing our resistance to tuberculosis.

The various symptoms of tuberculosis are evidence of disturbance in the functions of the organs of the body. This disturbance is the result of the excessive toxines which are produced through the growth and destruction of tubercle bacilli. These poisons are liberated from the diseased areas in the lungs and distributed through the system from the involved areas by the blood and lymph streams. The amount of this poison which is washed out into the system is, then, directly proportional to the rate at which the blood and lymph flow through the diseased areas. Rest, physical, mental and emotional, by slowing the action of the heart and lungs, reduces the amount of poison liberated into the system and tends to improve the function of the bodily organs.

Again, nature heals the lungs and walls off the diseased foci by the formation of fibrous or scar tissue. This scar tissue wall forms very slowly. It takes weeks or even months before it is anything more than fine shreds which may be destroyed with little effort. Deep or rapid breathing, boisterous use of the voice and movements of the chest tend to destroy this new tissue as fast as it is formed. Rest, then, favors the healing or walling off of the diseased areas; it reduces the amount of the poisons washed into the system and it conserves the body tissue; consequently it is a potent factor in the treatment of tuberculosis.

In this discussion I have placed graduated exercise as the second important physical factor in the treatment. There is some difference of opinion as to just what place it should occupy. However, there is a stage in the cure when exercise is of vital importance. It is the means by which we test the degree to which the disease has been overcome. It is the means by which we aim to safely guide our patients from a condition of invalidism back to normal life. In addition, exercise, when it can be endured, also serves a very beneficial part in the improvement of the metabolism and in buoying up of the spirit of the patient. Exercise, if injudiciously prescribed or taken, has disastrous results. Most of the relapses which occur during the first two or three years following the period of bed rest are due to unwise exertion.

At the beginning of treatment, I believe all patients should be put to bed. This gives them a chance to think seriously, to get a hold on themselves and to realize that they have a serious disease. The time and manner in which exercise should be begun must be decided for each individual case. It depends upon the particular type of the disease, and upon the physical and mental reaction of the patient to his disease. A safe rule is to always go slowly. Generally speaking, exercise should be begun by having the patient sit up in bed for a few minutes once or twice a day. If there are no untoward results, the sitting up in bed should be gradually increased a few minutes every day or every other day. After the patient is able to sit up a half to one hour twice a day in bed, he may be allowed to take his sitting up exercise in a reclining chair, this being gradually increased until he is able to be in the cure-chair throughout the day except the rest period of two hours following the noonday meal.

In dealing with the average case, when the patient is able to sit up two or three hours a day without any bad results, walking slowly five minutes once or twice a day may be permitted. If there are still no bad results, the walking exercise may be increased about fifteen minutes every two or three weeks. When the patient is able to stand the minimum amount of exertion which it will be necessary for him to endure in ordinary life, he may be dismissed from continual supervision, but the fact should be firmly impressed upon his mind that he recently had active tuberculosis, that his lungs are not yet entirely healed and will perhaps not be for some two or three years, during which time he must get all the rest possible. If he works eight hours he must rest the balance of the twenty-four. Finally, he must understand that it is possible for him to break again, regardless of his condition. If he has learned how to live, the chances are that he will have no more tuberculosis, but will live as long or longer than he would, if he never had had the disease.

The earlier ideas of advising the patients to stuff themselves with food were not based upon a thorough knowledge of the physiologic activities of the body and have been discarded in the modern treatment of the disease. Tuberculosis is overcome to a large extent through the digestive tract; consequently we aim to spare this tract as much as possible. Excessive and wrong feeding results eventually in an upset digestion with an inability to take and digest the proper amount of food. When the digestive system is once so upset, it is an arduous task for the patient and the physician to correct this disturbance. Marked increase in weight does not necessarily mean that there is a corresponding improvement in the lung condition. On the other hand, the destructive process in the lungs may continue or be increased.

Excessive gain in weight adds an extra load for the body to carry and it adds to the work of the various organs which have to do with the assimilation of food and the elimination of waste products. A gain from three to five pounds a month is the most lasting and the most favorable. The object is to strengthen rather than to fatten the patient. Unless a patient shows special digestive disturbances, he should be advised to take a rational, well-balanced diet, such as would be suitable for a healthy individual. It is necessary for him to eat just a little more than he would in health in order to compensate for the increased tissue destruction in tuberculosis. When the patient's weight has reached normal or a little above normal, the diet should be regulated so as to hold the weight around this point. In the event of digestive disturbances an effort is made to determine the foods which might be responsible. If such are found, they are eliminated from the diet and an attempt is made to substitute suitable articles.

Many patients, through a lack of appreciation of the dietary requirements, become faddists regarding food. Again, the gastrointestinal tract of certain patients appears to be particularly susceptible to the poisons of tuberculosis. These patients become imbued with the idea that their principal trouble is due to a primary derangement of the digestive system. They drift from place to place seeking relief from this condition, wasting their strength and aggravating their lung condition, and at the same time increasing their digestive trouble. Others, believing certain articles of diet are responsble for their digestive disturbance, finally arrive at a stage where they take a limited variety of foods with the result that they reach a high state of starvation, nervousness and anemia. A proper understanding of their conditions, with mental and physical rest in the open air, coupled with the assurance that they can eat like normal people, if they will, often brings about remarkable results in this class. Cannon has demonstrated in animals that peristalsis ceases when rage, distress or anxiety is manifested. An avoidance of overfeeding, coupled with a spirit of optimism, will do much in the correction of a large majority of the digestive disturbances.

Largely through the work of the New York Commission on Ventilation, we have learned that fresh air exerts its beneficial effects in tuberculosis, primarily by its effects through contact with the surface of the body, and, secondarily, through the respiratory tract. As brought out by this commission, careful, repeated investigation has demonstrated the fact that the decrease in oxygen in the worst ventilated living quarters is never more than one per cent, while the increase in carbon dioxide is at the same time not more than a fraction of one per cent.

Accordingly, Dr. C. E. A. Winslow, of this Commission, says, "Changes in oxygen and carbon dioxide which takes place in the air of ordinary occupied rooms are well within the range of health and comfort of the human body." Dr. F. S. Lee, of the same commission, says, "The problem of ventilation is physical, not chemical; cutaneous, not respiratory." This brings to mind the folly of the old window tents, where the patient slept with his head outside and the remainder of the body in a poorly ventilated room. It also enables us to appreciate the importance of teaching our patients the value of light clothing, and of taking advantage of every opportunity to expose the body as much as possible to the atmospheric air. We have thus come to realize the value of outdoor living, where climatic conditions permit the wearing of loose or light clothes. Even today there is considerable evidence that the marked improvement secured by heliotherapy, where the patient spends the greater part of the day in the open, unclothed, is due largely to the air bath.

Winslow has further added, "We must look for the general effects of vitiated air to unfavorable conditions of temperature and climate." In regions of relatively high humidity the damp air interferes with evaporation from the skin and the regulation of the body heat. In warm weather this tends to raise the body temperature and depress the patient. In cold weather moist air tends to conduct the heat from the body and produce chilling. On the other hand, a warm, dry atmosphere promotes evaporation from the body surface, thus cooling the body and tending to lower the temperature. In a cold, dry atmosphere the heat conduction is reduced to a minimum and chilling is unlikely. The greatest daily fluctuations of temperature are found in climates of lowest humidity. These daily fluctuations tend to stimulate the normal functions of the body as well as to afford an opportunity for relatively comfortable warm days and cool nights. Extremes of temperatures, especially that of extreme heat, are deleterious to the majority of patients.

The effect of altitude in itself is a factor to be considered. In the higher altitudes there is a general stimulation of the nervous system. In some cases this may result beneficially, while again it may cause restlessness and especially loss of sleep. On the other hand, there are a certain number of patients whose bodily functions as well as mental states are depressed by the conditions of the lower altitudes.

The process in the lungs is affected directly, to some extent, by climatic conditions. In higher altitudes the lighter atmospheric air demands a more rapid action of the heart and lungs. In recent or extensive cases this may result in increased toxemia or a spread of the areas of disease. The drier air of the higher altitudes, as well as the desert air of the lower regions, is often a distinct benefit to the class of patients who have considerable secretion in the bronchial tubes. Again, some patients are made more or less uncomfortable by a too dry atmosphere and its accompanying dust, as evidenced by a disagreeable dryness in the nasal mucous membrane and a feeling of restlessness, and this is especially true if there is an involvement of the larynx. These same patients very often are relieved by the more humid conditions of certain lower altitudes.

It is needless to say that the application of any of these separate physical factors used in the treatment must be worked out in detail for each case. This is true because we have different types of tuberculosis and because no two individuals react alike to the disease. The working out of the details can be accomplished only through a thorough knowledge of the history and physical condition of the patient and the clinical course of his disease.

I wish to say just a word in regard to the treatment of a few of the most important symptoms of tuberculosis. Hemorrhage, either large or small, is usually a source of great excitement to the patients and their friends. However, statistics show that 65 per cent of the patients who have tuberculosis have hemorrhages, while less than 2 per cent suffer any serious result as a direct result of the hemorrhage. Reassurance, both to the patient and his friends, is the main factor in control of hemorrhage. This can usually be accomplished by explaining to them that a hemorrhage is an accident and not necessarily a dangerous occurrence, and that the body is able to manufacture a pint of blood every twenty-four hours.

Aside from the use of pneumothorax, I do not feel that we have any agent that we are sure has any direct effect in checking a hemorrhage. A review of the work of the leading men of the country will show that scarcely any two men use the same thing outside of pneumothorax, in the case of hemorrhage. This alone is evidence of our lack of knowledge along this line. In our clinic we have been accustomed to use an intravenous injection of 8.5 per cent sodium chloride solution, the idea being that this hypertonic solution increases the coagulation of the blood through a destruction of the blood platelets.

I wish to sound a word of warning against the routine use of morphine, or any of the other derivatives of opium, in a case of hemorrhage. These tend to destroy the cough reflex and very frequently result in a posthemorrhagic pneumonia. If such a condition does not cause death, it is very likely to cause an extension of the disease into the healthy parts of the lungs. We also avoid the use of the ice-bag because we believe it has a tendency to cause pulmonary congestion.

The average patient with tuberculosis seems imbued with the idea that he must cough or he will drown in his own secretions, or will die as the result of accumulation of poisons in his chest. Clinical experience has demonstrated that most coughs can be reduced by the patient's own efforts so that they are not troublesome. The patient should be shown how to suppress the cough. He should be told that the secretions will be brought up into the throat as fast as necessary by the cilia lining the bronchial tubes, and that gentle clearing of the throat is all that is required to remove them. It should be explained that coughing is very strenuous work for one sick with tuberculosis, that it is irritating to the larynx, to the bronchial tubes; that it tends to destroy the scar tissue in the lungs, and that, finally, it is in most cases useless.

Some patients, however, who cough as the result of a pleuritic irritation, or who are very nervous, must receive some assistance to relieve them from this troublesome symptom. In our clinic we most commonly use codein. This may be used alone, or where the secretions are especially tenacious, with a small amount of ammonium chloride. We believe that codein is a relatively harmless drug and may be given for a long time without any deleterious effect. Heroin, on the other hand, is a dangerous drug in that it tends to upset the digestive system and the patients very quickly form a habit which is very hard to break.

Night sweats are a troublesome symptom to a fairly large number of patients. These are due to two factors. First the effect of the poison upon the heat producing center, and, second, the lack of opportunity for proper dissemination of heat from the surface of the body. Patients who are troubled with this symptom should be instructed about sleeping with as little covering as possible so as to allow the air to circulate freely about the body. Experience has shown that sleeping with the feet outside the covers will sometimes give relief. A Japanese mat placed over the mattress, due to the free circulation of air which it permits, has in the hands of some given relief from this symptom. If we have to resort to drugs, 1/150 gr. of atropin, camphoric acid, grs. 12, or tincture nux vomica, minims 30, at bedtime will often give relief. Sometimes a teaspoonful of table salt at bedtime, or food taken just before the usual time for the sweat are efficacious.

Time does not permit the discussion of the treatment of all the symptoms of pulmonary tuberculosis. Outside of a few more or less simple remedies, the primary factors in relieving the symptoms of the disease are life in the open, the mental and physical rest produced by proper environment, and by close intelligent supervision.

Tuberculin, heliotherapy, pneumothorax and thoracoplasty are the special agents which occupy a prominent place in the care of tuberculosis patients at the present time. These agents should be used only in special cases and under special conditions. Tuberculin has found its greatest field of usefulness in tuberculosis outside of the lungs. It has, however, a place in the treatment of pulmonary tuberculosis. In the pulmonary cases its use must be governed by the greatest care, in order to avoid harm. I believe it should be avoided in the acutely active cases because of the danger of producing an overreaction with an overwhelming toxemia and a spread of the disease. In the type of cases which have been able to overcome their toxemia and wall off their disease to a fair extent, but are still not quite able to get on their feet, I believe that tuberculin, if cautiously given, will often increase the resistance so as to turn the tide in the right direction.

Heliotherapy, like tuberculin, has found its greatest usefulness in extrapulmonary tuberculosis. However, with the development of a more careful technic, its usefulness in the pulmonary type is being more and more recognized. With a careful selection of patients and following the Rollier technic, heliotherapy, natural or artificial, I believe is a valuable asset in the treatment of this type of cases.

Pneumothorax now has a well established place in the treatment of pulmonary tuberculosis. Its most enthusiastic supporters continue to advocate its use in the earlier cases, while the more conservative are loath to give it very great consideration. The medium course, I believe, should be followed. In our work, with the exception of special cases, we do not resort to pneumothorax unless our patients, after observation of a minimum time of two or three months, fail to make a satisfactory progress. The ideal case is that where the disease is largely confined to one lung. Experience has shown, however, that surprising results can often be obtained when the involvement of the best lung is fairly extensive. In all cases the air should be given in small amounts, not to exceed 300 c.c. at a time. In the cases where the better lung has a fairly extensive involvement, the air should be injected frequently and in smaller amounts, from 100 c.c. to 200 c.c. In these cases the benefit comes primarily from compression of the worst lung, and secondarily from a less compression of the contralateral lung, due to a deviation of the mediastinal contents.

In the induction of pneumothorax there are various degrees of collapse obtained. The best results are secured when a fairly complete collapse of the lung takes place, but where adhesions make this impossible, a partial collapse frequently brings about the desired results.

Thoracoplasty, while the more recent of these special agents, has proven its value in selected patients. Striking results have been obtained in cases that were otherwise hopeless. Great care should be exercised in selecting cases so as not to bring the procedure into disrepute. The patient should be in fairly good general condition, and the contralateral lung should have very little, if any, activity. The operation should be done in at least two stages and under local or gas oxygen anesthetic.

NONTUBERCULOUS PULMONARY ABSCESS

ITS INCREASING FREQUENCY*

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The increasing frequency of pulmonary abscess and the apparent difficulty in its differentiation from pulmonary tuberculosis has prompted this effort to set forth some of the salient and easily recognized symptoms of the disease. An abscess of the lung is a focus of suppuration within the lung substance. It must be differentiated from suppuration confined within the lumen of the bronchial tree, such as putrid bronchitis and bronchiectasis. It is of necessity accompanied by a destruction of lung tissue. A necrosis and bacterial liquefaction of this tissue must take place. Therefore, an abscess with its pus cavity is sometimes of small and at other times of extensive proportions. In the extensive involvements there is apt to be sloughing of the lung tissue which indicates a gangrenous condition and which should not be confused with true abscess formation. This type of lesion is found when two or more abscesses of considerable size develop in close proximity, and the intensity of the inflammatory process obliterates the blood supply to the intervening tissues and adnexa.

ETIOLOGY

Regarding the etiology of lung abscess, there is a great diversity of opinions. There are two main points at issue. One, supported by clinical investigators, and particularly following tonsillectomy, is that the great majority of pulmonary complications are due to aspiration infection, the major portion of them following operation under general anesthesia. Another group believes that the majority of pulmonary complications take place through the blood stream (aspiration versus embolus).

Dr. Emile Holman, professor of surgery at Stanford University Medical School, together with Weidlein and Schleuter in 1925, were unable in eleven attempts to produce a pulmonary abscess by introducing infected foreign bodies directly into the bronchial tree. After quoting from the experience of several investigators with similar results they state, "It is evident, therefore, that experimentally the adherents of the aspiration theory have failed to obtain any support."

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Continuing the work in the Stanford laboratory with Dr. L. Chandler, they were able in ten out of twelve attempts, by utilizing a septic embolus introduced into the circulation through the jugular vein, to produce a pulmonary abscess by this method with fatal results in four instances. It would seem that experimentally there is little evidence to support the view that intrapulmonary abscesses are in most instances the result of the aspiration of infected material.

Dr. Frank Kistner, in a splendid article in a recent issue of the NORTHWEST MEDICINE, calls attention to the danger arising from disease of the accessory sinuses, demonstrating the ease with which the bronchial tract may be involved. Hartwell and Dudley conclude that pulmonary infections of the pneumonic type are sufficiently productive of lung abscess to put the practitioner always on his guard with reference to this complication. Pyogenic organisms may produce abscess without the development of an antecedent pneumonia. Aspiration abscess is not rare and prophylaxis must be employed in upper air passage operations. The lung possesses a very considerable resistance against abscess formation, following external traumatization and the harboring of foreign bodies entering by this path. Too hasty operative interference is, therefore, to be guarded against.

PATHOLOGY

The time required for the development of a pulmonary abscess varies according to the virulence of the infecting organism. Following the initial illness, an abscess may make its appearance within ten days. Sometimes, however, the process does not take place for weeks or months. If the drainage is not sufficient the process will be prolonged, sometimes resulting in a chronic inflammatory, ragged, necrosing mass with bacteria and thrombosed blood vessels filling the air vesicles and the interstitial spaces.

SYMPTOMS

The symptoms of pulmonary abscess depend largely upon the antecedent disease or infection. The cough is a disturbing factor. The character and amount of sputum differs in proportion as the drainage is free or restricted. Often, when the process is situated in the periphery of the lung, in the early state, there is a hacking cough, with little sputum, a rapid pulse and a rise of temperature and, as the necrosis progresses, there will be evidence of septic infection. As the necrosis increases the pus will follow the line of the least resistance. If a bronchus of sufficient size is opened, sputum of a sweetish and offensive odor is coughed up at irregular periods.

If the seat of the abscess is situated near the pleura, an opening may be forced through the parietal layer and the pleural sac become infected, resulting in empyema. Multiple abscesses may form. Particularly prone to this condition, in my experience, are those of feeble resistance, following a prolonged case complicated by the pneumonias, influenza or tuberculosis. They may break and discharge singly, evacuating an amount of putrid pus, the patient being apparently relieved for a time until another abscess forms and discharges, the patient gradually becoming less resistant and the sepsis increasing until the end.

In another from of multiple abscess there may be coalescence and a large cavity will form, with ragged edges. A gangrenous process may be established, septic symptoms become more violent, when, if unable to find drainage and surgical aid is not provided, the patient will rapidly succumb to the violence of the infection. Positive evidence of an abscess is found, if the elastic fibers are found upon microscopic examination. Following pneumonias, the pneumococcus usually appears in the sputum. The influenza bacillus is frequently found and it is not uncommon to find the tubercle bacillus in small numbers in cases of prolonged invalidism.

The color of the sputum is usually dark and frothy, which on standing separates into layers. Pain is rarely present, unless the pleura is involved. A sense of fullness and tenderness may be experienced when the sac is distended, the patient experiencing relief after a copious discharge of pus. Wherever an abscess is found of sufficient size to be detected by physical signs, a zone of inflammation and engorgement will be found surrounding the abscess, the walls of the abscess being more ragged and less sharply defined than that of a tuberculosis cavity.

PHYSICAL SIGNS

The physical signs of pulmonary abscess are often confused with those of bronchitis and pleurisy. Both are frequent concomitant lesions. If, however, the abscess cavity is large and superficial, there may be dullness on percussion, tactile fremitus increased, slight variation from normal in breathing, and moist rales over a limited area. If the abscess is filled with fluid, there will be a loss of voice sounds and marked dullness on percussion. If the cavity has drained, distinct bronchial breathing may be heard; also metallic rales may be present with a tympanic percussion note and increased voice sounds.

DIAGNOSIS

In the diagnosis of lung abscess, it is of great importance that a most complete personal and family history should be obtained. A history of tuberculosis in the family, or of contact with one having the disease, may have an important bearing on the case in question. Frequent colds, pneumonias or pleurisy, either fibrinous or with effusion will aid in determining the condition of the pleuræ. Given a case, apparently in good health with no history of previous pulmonary complications, who is suddenly taken ill with high temperature, rapid pulse, and with cough and expectoration, resembling the pneumonias or influenza, which after a given time raises large quantities of sweetish sickening pus, this presents reliable symptoms of a pulmonary abscess. Such symptoms are contrary to our usual findings of a tuberculous cavity. In bronchiectasis there will be seen by the radiograph a dilated bronchus, not a ragged necrosing cavity, and there will be an absence of the shreds of elastic tissue with alveolar surroundings. The sputum will lack the characteristic appearance of the lung abscess. In gangrene of the lung it is almost impossible to differentiate by the physical signs alone; in fact, both conditions may be present. The radiograph, the microscope and the odor afford the greatest aids in diagnosis. In the small or multiple abscess formations, only by daily observation in the changes, the character of the sputum, the degree of sepsis and the microscopic findings can a diagnosis be accurately made.

PROGNOSIS

The prognosis of pulmonary abscess is at all times grave and requires serious consideration. It is a question in which the combined judgment of the internist, the surgeon and the bronchoscopist should be available. If the abscess is large and superficial, the drainage is adequate, and the sepsis is not marked, the prognosis would be considered favorable. If, on the other hand, the drainage is scanty, the sepsis marked with high temperature, sweats and exhaustion increasing, bronchoscopy or drainage is of vital importance.

TREATMENT

The first requirement is absolute bed rest, combined with postural drainage. As soon as diagnosis is established, treatment is begun with close observation of temperature, sputum and roentgenograms, which are taken at least once a week. Frequent conferences should be held and, if progress is not deemed satisfactory, the following additional methods of treatment recommended. Bronchoscopy, surgical incision and drainage, and artificial pneumothorax. It is rarely that any of these are employed before the expiration of several weeks of rest and postural treatment.

The value of prolonged bed rest in the treatment of lung abscess is just being appreciated. Rest should be prolonged for weeks or even months in a manner very similar to that employed in a case of partially arrested tuberculosis.

Postural drainage. Generally the patient is completely inverted with the waist bent over the edge of the bed and the head down, the body being twisted so as to bring the affected side uppermost. In each case the best position for drainage must be discovered by experimentation.

This posture should be prescrbed at regular intervals, usually every three or four hours at first and maintained from five to twenty minutes. An observant patient soon learns from his own sensations when he needs drainage. In proportion as the cavity is more or less completely emptied, in such proportion will the cough and temperature subside and a feeling of comfort be experienced.

Bronchoscopic treatment. In many cases bronchoscopy at weekly intervals is a most valuable adjunct in establishing more prompt and direct drainage. It is the passage of the tube, together with the suction employed, which is valuable. Lavage and application of medicaments are contraindicated. Its possible danger and discomforts can be eliminated only in the hands of an operator who is unusually skilful, experienced and of mature judgment. Bronchoscopy is not favored in abscesses peripherally located or not communicating with a bronchus, and is less apt to be successful in high upper lobe cases.

Artificial pneumothorax. There seems to be a diversity of opinion regarding the use of this measure in the treatment of lung abscess. In my own experience, I have found that only those cases with free drainage, and particularly those near the hilus received benefit by the application of artificial pneumothorax. There is always the danger of pleural rupture and acute septic empyema. Tewksbury is a warm advocate of the procedure in early cases. Of ten cases in the series reported by Miller and Lambert three were benefited and seven unimproved. This measure is always of problematic value, due to the mechanical or pathologic condition around the abscess.

Surgical operation. This eventually becomes necessary in forty to fifty per cent of the cases. It consists of incision and drainage, with the resection of two or more ribs, in two stages unless there are adhesions, and preferably under local anesthesia. The operation is dangerous if performed during the acuter phases, and is usually unsuccessful. After the constitutional symptoms have improved, and the secondary zone of infiltration about the abscess has cleared, it is time to operate, but not after thick fibrous walls have formed.

TUMORS OF THE THORAX*

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It has been stated that more tumors of the chest are discovered at the autopsy table than are found elsewhere, and this to a certain extent may have been the case at one time. We do know, however, that more morbid growths are being found and reported than formerly, while our methods of diagnosis have not become so much more acute, nor are our clinicians more painstaking than were our confreres of the past.

There is no doubt that there is an increase in the number of chest neoplasms. It is not known whether this is due to industry producing more irritating substances to the lungs, as given by some authors, or on account of the damage to pulmonary tissue resulting from the influenza epidemic, or to factors as yet unnamed.

We have seen some twenty-seven cases of chest tumors, of which twenty-four were lung neoplasms. All but four of the cases were diagnosed as cancer. In only six could a primary growth be discovered elsewhere. Of these cancer of the breast in five was looked upon as the original lesion, the other tumor being metastasis from a melanocarcinoma of the abdominal skin.

Malignant growths may occur at any age, one of our cases, a sarcoma, occurring at the age of twenty-six, the oldest being seventy-five years old, although sixteen developed between the ages of forty and sixty. Carcinoma is the rule after the middle period of life, and sarcoma is commoner in the first. Endothelioma, about which there is so much dispute and which histologically is midway between the carcinoma and sarcoma, may occur at any age. Three of these cases were very likely this tumor.

Tumors of the lungs are more common in men than women, in our series fifteen being males with only twelve females. Fishberg gives the percentage of 73 per cent in men to 26 per cent in women in sixty cases at the Montefiore Hospital. Adler in 374 cases gives 71.9 per cent in men. The right lung was affected in fifteen of our cases against ten of the left.

Cobalt miners are reported as having a higher percentage of sarcoma of the lung, this condition probably being due to irritation or possible infection. Anthracosis as well as tuberculosis are considered as irritative factors, as is also syphilis. Only one of these cases had a positive Wassermann, and had received treatment, while five of the others either showed a positive sputum, or acid-fast organisms were recovered from the pleural effusion.

The lungs may be involved by direct extension from adjacent lesions, as carcinoma of the breast, esophagus or thyroid, or by metastasis from a distant organ such as stomach, liver, prostate or adrenals by way of the blood stream.

Tumors of the mediastinum, which are usually malignant, are of great importance, as the space in this region is limited, and there are closely confined important structures. The commonest malignant tumor is sarcoma, and the dermoid cyst of the benign is most frequently seen.

In the lungs primary cancer occurs about twice as often in the bronchi as in the parenchyma, and it varies from the hard schirrus to the colloid or gelatinous form. They may arise in the lining epithelium, frequently at the bifurcation of the bronchi, giving rise to the cylindrical celled papillary or alveolar forms or if metaplastic to squamous celled carcinoma.

The cylindrical celled tumor is the commonest type found in the lungs. Submucous bronchial glands may be the site of adenocarcinoma which may show mucilaginous or colloid degeneration. The tumor is often manifest early by obstructive symptoms, degenerative changes, infection and symptoms of lung suppuration. It is quite often impossible either macroscopically or by the microscope to localize the beginning point of the lesion.

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Malignant tumors usually take origin in the hilum of the lung, and extend outward along the peribronchial or lymphatic channels into the lung, or else occur as isolated nodules in the parenchyma from which extension occurs. More rarely is seen a condition where hundreds of minute nodules, almost identical with miliary tubercles, are scattered throughout the lung and to which the name miliary carcinomatosis is given. Sarcoma gives at times a similar picture. Two of our cases showed this condition with a carcinoma spread.

Extension as a lymphatic peribronchial infiltration occurs, giving a picture similar to tuberculous infiltration, or a chain of discrete nodules will follow a similar course, causing obstruction of the bronchi, and producing atelectasis of the part of the lung involved. The cancer is grayish-yellow, or whitish in color, of more or less firm consistency except the colloid, or gelatinous form, which shows a tendency to break down, leaving a cavity.

Sarcoma is more apt to be found as a discrete tumor either single or multiple, varying in size up to that of a grapefruit, usually grayish-white, or reddish and softer in consistency. The round cell sarcoma is more frequently found, and tends to metastasize less often than the carcinoma. This becomes of importance from a treatment standpoint. One case showed at autopsy a sarcoma five inches in diameter.

There is a certain amount of atelectasis and congestion around tumors of the lung. Bronchopneumonia, abscess or gangrene may occur, and when the pleura becomes involved, in 50 per cent of the cases there will likely be accumulation of fluid either serous or sanguineous, and at times purulent. In the pleural form there is a marked thickening and infiltration, and there is a type where the pleura is studded with hard nodules of varying sizes. Seven of the pus cases showed a sanguineous effusion and one was purulent, this being late in the disease and after frequent tappings.

In the diagnosis of pulmonary growths the utmost care should be exercised in correlating the clinical findings, as so much depends upon the interpretation of these. A careful history should be taken, including antecedent operations, age of the patient, symptomatology as well as careful physical examination. Radiograms, and in some cases bronchoscopy and laboratory tests should be made.

SYMPTOMS

As a rule the onset is insidious, the patient having given a history of cough and bronchial symptoms often lasting for weeks and months. Dyspnea is almost invariably present, as is also pain, and quite often hemoptysis, or even marked pulmonary hemorrhage. Some patients give a history of chills, fever, cough with sanguineous expectoration, who have been diagnosed and treated for pneumonia which failed to resolve and clear up. In two of our cases direct injury to the chest wall was cited as marking the onset of this pulmonary trouble. Some cases had had an antecedent bronchiectasis, chronic bronchitis, emphysema, or tuberculosis and show in 25 per cent of the cases (Fishberg) clubbing of the fingers.

The cough, which has been present in almost all of our cases at first, is dry and hacking, brassy and persistent. Later, as the involvement extends with necrosis and breaking down of lung parenchyma, it becomes more or less productive. The amount and character of sputum varies, often simulating that of a lung abscess. The sputum will sometimes show the large refractile spheroid bodies, containing fatty granules (Lenharz), or show necrotic tissue or dark thick current jelly-like masses. Ten patients had bloody sputum, varying from streaked sputum to large copious hemorrhages.

Most of these cases show marked dyspnea usually early in the disease, and quite often out of proportion to the lung tissue involved. This very likely is due to pressure of the tumor with plugging of bronchi, tracheal compression, pleural effusion, nerve trunk pressure or loss of elasticity, and compression of alveoli of the lung, due to the infiltration of the perivascular and peribronchial lymph channels (lymphangitis carcinomaosa). In the mediastinal tumors and enlarged glands stridor may be present, if there is tracheal compression.

In the earlier cases chills and fever are apt to be slight but later in the disease, when breaking down of the parenchyma occurs, fever may mount to 104°. Some of these cases may reach operations for lung abscess or gangrene.

Pain is one of the most significant symptoms complained of. It usually occurs early in the disease and varies from the deep boring pain of mediastinal tumors to paroxysmal, sharp agonizing pain of pleural involvement. This is more or less constant and may be felt in the arm or be referred to the spine which often may be looked upon as the seat of the trouble. There may occur with mediastinal tumor cyanosis, dilatation of the veins of the face and arms. Enlarged lymph nodes, especially of the supraclavicular fossa and axilla may occur late in the disease. Two of our cases showed enlarged glands above the clavicle early.

DIAGNOSIS

The symptoms referred to previously, such as cough, dyspnea, pain, slight fever and sputum in any patient over thirty-five or forty should not only suggest the ordinary lung conditions but malignancy as well. With tuberculosis there is almost always the history to guide us and often the physical signs of active disease on one side with fibrosis on the other. The radiogram should aid in ruling this out. The pulse is apt to be rapid in tuberculosis, while with tumors it is likely to be so.

The physical signs of percussion and auscultation are usually quite characteristic in pulmonary tumors. In place of the ordinary impaired resonance, dulness or even tympany on percussion, we are apt to find a flat note and this evident to the pleximeter finger. This flatness, suggestive of fluid, usually extends from the sternum or beneath it outward, and is observed near the inner end of the clavicle. This note may be found localized in the front of the chest, while the rest of the lung shows normal resonance or vice versa. The breath sounds over this region are diminished or absent and until late in the disease adventitious sounds are absent. Occasionally, however, bronchial breathing may be transmitted near the sternum, or in the interscapular space along the course of an infiltrated bronchus, but never, as in tuberculosis, above the third rib, in the supraclavicular fossa, or in the axilla. Over a lung ascess the percussion note is seldom so flat nor is one able to map out the lesion so clearly. The breath sounds here are apt to show cavity signs and those of presence of moisture.

The radiogram in the earlier stages of tumor is apt to show not more than enlarged nodes near the hilum, or perhaps somewhat later, along the course of a bronchus in the peribronchial lymph channels, shadows may be observed. At times a tumor shadow extends outward, simulating an interlobar effusion and may thus be incorrectly diagnosed. With an x-ray plate showing large nodules at the hilum, and the physical signs of flatness and absent breath sounds extending outward (due to occlusion of the bronchus and atelectasis by this lymphangitis carcinomatosa), one is justified in the presence of the other characteristic features in making the diagnosis. An induced pneumothorax at times may, by collapsing the lung, make evident a tumor otherwise not visible.

As the case progresses the signs of breaking down of pulmonary tissue may be elicited. There may be present all the evidence of lung suppuration. Dyspnea becomes a more prominent feature, sputum increases with often a foul odor, clubbing of fingers is present, temperature up to 103° or 104°. Chills and blood spitting or even severe hemorrhage may become manifest.

The ordinary pulmonary abscess usually occurs some seven days to two or three weeks following operation on the upper respiratory passages or in the postpneumonic cases the history of a recurrent pneumonia should guide the observer. In tumor there is more often the history of the characteristic symptoms of several weeks or months duration, and we are apt to find the characteristic physical signs of tumor. In lung suppuration, unless there be present an old abscess with marked thickening of the pleura (which we have sometimes observed), the percussion note is not flat. There is not the condensation of tissue as is the case in tumor formation.

The radiogram in deep seated tumors is of more diagnostic value. Tumors developing in this locality, arising from smaller bronchi or alveoli, often show rapid growth, outgrow their blood supply and with subsequent necrosis form abscesses rapidly. Radiograms taken give no conclusive evidence, but with the use of morphine at night and abolishing the cough reflex there is retention of secretions. An x-ray plate taken the next morning may show a well filled abscess. The echinococcus cyst may give a similar picture but the presence of hooklets or cyst membrane in the sputum with eosinophilia may clear the diagnosis.

With involvement of the pleura there is almost invariably the presence of fluid, and this is more apt to occur when the lower lobe is involved. The ordinary pleural effusion usually follows an acute pleurisy attack with pain, fever and dyspnea, and these symptoms are more or less relieved after fluid becomes present. There is normal resonance of tympany (Skoda) above the fluid level and breath sounds and even rales heard in this region. After thoracentesis the pain and dyspnea may be relieved. These effusions do not often tend to fill the entire chest and if they do, the mediastinum is apt to be displaced to the opposite side.

With tumors, particularly cancer, the pain with effusion is more or less constant, agonizing at times. It seldom shows displacement of the mediastinum to the opposite side, often the contrary being the case. Effusion is apt to be massive, dyspnea marked and after tapping there is little or no relief of symptoms. These effusions tend to reaccumulate after withdrawal. There is a flat note on percussion and absence of breath sounds over the fluid and this extends above the effusion. The opposite lung in tumor cases is usually clear, whereas in tuberculosis an older lesion is often observed. Withdrawal of fluid and diagnostic pneumothorax may give much information. The effusion should be studied in the laboratory, centrifuged sediment mounted and stained. The presence of distinctive cells, however, is not too reliable.

The bronchoscope should be used in many of these cases and at times the lesion can be observed in the bronchial lumen or a bulging of the inner surface may determine its location. One case still alive received a positive diagnosis a year and one-half ago by this method.

Where syphilis is present or suspected the therapeutic tests should be made. Actinomycosis may simulate tumor but persistent sputum examinations, presence of the sulphur yellow granules, the ray fungus, as well as the presence of lesions elsewhere may make the diagnosis.

The treatment of lung tumors has been more or less unsatisfactory. Irradiation by x-ray or radium or operative procedure offer what hope there is. Lobectomy and tumor removal has been done. Open thoracotomy with application of radium has helped in some cases as well as complete removal of the lung. After deep x-ray therapy in some cases the tumor has disappeared and complete relief obtained for years.

Most of these cases survive a few months to sometimes a year or more. One case of lymphosarcoma, a slide of which is shown, is alive three years later after deep x-ray therapy.

INLYING URETERAL CATHETER IN TREATMENT OF PYELONEPHRITIS AND OTHER RENAL CONDITIONS. Daniel N. Eisendrath, Chicago (*Journal A. M. A.*, Dec. 24, 1927), pleads for the more widespread use of prolonged drainage of the kidney by the inlying catheter in the treatment of anuria of the obstructive type; acute and chronic pyelonephritis; the relief of the severe pain incident to acute uteral block, e. g., by a calculus or by kinking of the ureter in abnormally mobile kidney; in cases of ureteral injury following operations, such as hysterectomy for fibroids, or after the Wertheim radical operation for uterine cancer, and as a method of drainage of the kidney after repair of a vesicovaginal fistula. Thomas and Magoun have recently employed inlying ureteral catheters for this purpose. A small catheter is to be preferred because it permits drainage alongside as well as through its lumen. Lavage of the renal pelvis can be used as a daily supplementary method, but is of little additional advantage. If there is a tendency for the catheter to be expelled when the bladder becomes filled and is evacuated spontaneously, the use of a urethal inlying, or retention, catheter will act as a constant drain for the urine accumulating in the bladder.

THORACOPLASTY

INDICATIONS AND AFTER CARE*

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There is no need today to present arguments showing the value of lung compression in tuberculosis, as this procedure has long been universally employed. But the method of applying compression which has become so familiar to the profession is that known as artificial pneumothorax, or the introduction of air into the pleural space. This is frequently spoken of as "medical compression" as distinguished from "surgical compression" which we are about to discuss.

There is no other branch of surgery which so completely requires close cooperation between internist and surgeon as does thoracoplasty. This is a radical procedure, requiring unusual study and understanding and which is almost sure to be disappointing if the surgeon undertakes it alone. The patient must be under close observation of the tuberculosis specialist for a period of months before surgery is done. During this time the physician does his best in a medical way to get the patient well. The great majority of patients never come to thoracoplasty. The physician makes repeated physical and x-ray examinations, at the same time studying the symptoms and becoming thoroughly acquainted with the case. Most careful attention must be given to all details.

While the use of thoracoplasty as a last resort is deprecated by all good men, yet it is, as a matter of fact, a last resort in that every other known applicable procedure has been thoroughly tried out before surgery is done. Obviously, then, the patients coming to thoracoplasty represent a hopeless and otherwise helpless group with which the surgeon has to deal. However, even though from this point of view it is a last resort measure, it must not be assumed that it is to be recommended when the patient is rapidly approaching the end, as it will most certainly hasten his approach.

In the ideal case for operation we find the patient has so far improved under medical treatment as to present a picture of fair health with stationary disease and no complications. He can proceed no further without thoracoplasty and in fact is constantly subject to exacerbation, relapse, extension of lesion and complications, yet by the judicious use of surgery he is offered marked improvement or even clinical cure.

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In the past, no doubt, we have postponed surgery too long, permitting the case to retrograde beyond the safety line. Just now perhaps the tendency is to swing the other way because of glowing accounts of success. A little later the accumulated experience of larger numbers of workers will serve to develop our judgment as to the indications and the optimum time for operation. It may be assumed that early operation might save the patient months of time, and certainly it would improve the statistics on thoracoplasty, but it must never be forgotten that it is a measure all patients wish to avoid unless life depends upon it.

What, then, are the indications for thoracoplasty? In his prize monograph on "Surgery of Pulmonary Tuberculosis," Alexander says: "Too many factors demanding individualization in the selection of patients for thoracoplasty make it impractical to present a list of categorical indications and contraindications that can be safely followed. In general, however, those patients are chosen for operation who have moderately or far advanced chronic tuberculosis with or without hemoptysis, whose lesions are of the fibroulcerative type, with or without cavitation or empyema, and are principally confined to one lung; whose general condition, heart and individual resistence to tuberculosis are fairly good and in whom all other treatment has failed, including a sufficiently long sanatorium regime and attempted artificial pneumothorax. Obviously the relative number of such patients is not large, but the aggregate number is great."

We never call in the surgeon until artificial pneumothorax has been thoroughly tried because we have reason to place a lot of faith in this method. If pneumothorax is impossible because of adhesions, or if, as is often true, after long continued pneumothorax the case comes to a standstill because fibrous walled cavities resist collapse, then we begin to study the case all over again with surgery in mind.

Lilienthal, in his comprehensive work on thoracic surgery, says that collapsing thoracoplasty is the most striking surgical procedure which has been devised for the relief and cure of tuberculosis. He calls attention to two outstanding dangers. The first is that the operation will be done by surgeons not properly equipped with knowledge and experience of thoracic surgery. The second danger is that many who operate will be deceived by the immediate improvement and will neglect the long postoperative treatment so necessary to ultimate success.

It must be remembered that thoracoplasty does not remove the disease as does appendectomy. The patient has exactly as much tuberculosis after operation as before. The whole purpose is to put the lung permanently at rest, thereby immediately diminishing toxemia and gradually facilitating fibrosis.

In determining the expediency of thoracoplasty in a given case, we do not care particularly how bad the lung to be compressed may be since we ask no further function of it. Each case is an individual study. The vital points which must be considered are as follows:

1. The "good lung." The contralateral lung nearly always shows some evidence of tuberculosis infection; hence this is the first matter to consider. If the good lung harbors a lesion which is extensive and active, it is unnecessary to proceed further as surgery is out of the question. In a general way it is agreed that there must be no cavitation in the good lung, the lesion must not be a progressive one and, of course, not extensive.

2. We must be perfectly sure that the major symptoms arise from the lung to be compressed. The patient may be quite ill. This does not deter us, if illness be due to toxemia from the lung to be collapsed. But if due largely to intestinal tuberculosis or other condition outside the lung, then, even though the chest condition be ideal for thoracoplasty, operation will do him no good.

3. If the patient be either fat or emaciated, he will not stand operation so well. Experience shows that stout persons are poor surgical risks. Weight must be carefully reduced before surgery is undertaken. Likewise, emaciated patients have obviously suffered severely from toxemia and are having a hard time to keep up without the added burden of an operation. Every effort must first be made to build them up.

4. Age is of less importance in making a decision, but certainly plays a part in the prognosis. Results improve as age advances up to fifty. In our opinion this is due not to increasing ability to bear surgical intervention, but rather to the well known tendency to increasing fibrosis and to the development of tuberculosis immunity with the passing of years. Brunner's best results were with ten patients ranging from thirty-five to forty years. Eighty per cent were cured and 10 per cent died as result of operation.

5. Sex has no bearing in the matter of indications for surgery. Results show practically no difference. We have found it wise, however, to ar-

range the operation for a few days subsequent to the menses for obvious reasons.

6. Whether the right or the left lung is to be collapsed has little to do with our decision, but it is an interesting fact that operations on the left side show better results than those on the right.

7. Type of disease. Since the lung to be compressed is sacrificed for all time as to function, it does not matter from the point of view of respiratory capacity what its condition is, but it has been shown, as might well be anticipated, that the chronic fibroid lesion with retraction of trachea, heart, diaphragm, etc., is much more favorable for surgery than is the more acute progressive pneumonic or caseous type. The latter, if operated on at all, should be first subjected to phrenicotomy and later, if conditions warrant, a partial thoracoplasty.

8. Hemoptysis. In one of our cases before thoracoplasty we succeeded three times in gradually working the patient up to normal life through months of careful supervision, only to find him each time totally disabled by alarming hemoptysis. This man was clinically well each time prior to hemoptysis and examination always revealed a very satisfactory condition, but for a small area in the central portion of the left lung which always presented subcrepitant rales and from which doubtless his repeated hemoptyses arose. Thoracoplasty was done and has resulted in complete control of bleeding with, so far as one can tell, clinical cure.

9. General condition of patient. It is highly desirable to make sure that all other organs and digestion are functioning as well as we can make them. We cannot always rule out complications, but we can endeavor to get them well in hand before subjecting the patient to surgery. In our thoracoplasties we have had the following complications to deal with: Tuberculous laryngitis, tuberculous empyema, chronic myocarditis.

CONTRAINDICATIONS

A study of the foregoing discussion of indications will answer many questions regarding contraindications, but there are a few points to add. Bone or joint tuberculosis is considered a contraindication by Bull of Christiana. Von Muralt will not do thoracoplasty in the presence of Pott's.

Laryngeal tuberculosis usually improves after thoracoplasty unless acute and progressive. Saugman thinks even the severe form is not a contraindication, as the patient will certainly die without operation. Brauer, Spengler and Stocklin look upon any nephritis as a contraindication. Renal tuberculosis must usually be prohibitive. Bull did a nephrectomy in renal tuberculosis for weeks after thoracoplasty with a good result. Intestinal tuberculosis is so serious a complication that it is generally considered a contraindication.

POSTOPERATIVE CARE

The first important thing following thoracoplasty in enteroclysis. Dr. John G. Clark of Philadelphia recommends the following: "Immediately after the operation one liter of sodium bicarbonate solution (5 per cent) at 105° F. with 2 ounces of Squibb's paraffin are given as an enteroclysis. Through this method we immediately give stimulation through the heat to the patient. Abundant fluid is immediately absorbed, thirst is largely eliminated and the large intestine is forced through hydraulic action to assume the normal functioning position in the abdomen, thus eliminating the possibility of exaggerated tympanites from slight kinking of the colon.

POSITION IN BED

Men who have done extensive work in thoracoplasty all recommend placing the patient in a semisitting posture, inclined toward the affected side. This is perfectly logical and should always be attempted. Our limited experience indicates that most patients soon insist on adjusting themselves to the position they find the least uncomfortable.

IMMEDIATE EFFECTS

For several days there is considerable pain, fever, tachycardia, dyspnea and sometimes cyanosis, scanty difficult expectoration. Occasionally the weak and rapid pulse, the cyanosis and the apprehension of the patient almost make the physician wish he had never heard of thoracoplasty or, better still, had never studied medicine. But in most cases these serious looking symptoms of compression, toxemia and cardiac embarrassment are relieved in a few days and the progress becomes highly encouraging. Morphine is indispensable for both pain and dyspnea.

If the heart will permit, the patient must be requested to try to raise sputum every half hour, otherwise the general circulation will be flooded with toxins. Change of position often facilitates emptying the diseased lung. Sauerbrouch recommends 20 mm. of tr. belladonna three times a day, if the quantity of sputum is excessive. Caffeine and digitalis are useful for support of the heart. Oxygen inhalations are sometimes useful because of the great and sudden reduction of respiratory capacity.

Stocklin reported six deaths from aspiration pneumonia in 100 cases. We use the Oelgetz thoracic splint to support the operated side. Such a binder has the further advantage of aiding compression of the lung and retraction of the chest wall.

There is no other period in the tuberculosis patient's career when good nursing is so imperative. Good nursing and all that goes with it are frequently directly responsible for carrying the patient over the danger time into the period of relative safety. The thoracoplasty patient should spend several months in the sanatorium after operation and be worked back to normal life with the greatest caution and patience.

At Laurel Beach Santorium we have had no difficulty in securing the patient's consent to operation when we have determined upon it. On the contrary, we have in certain instances felt considerable strain upon on ingenuity in the case of patients not suitable who are eager for it. Advanced cases, realizing everything else has been done and who are slipping, sooner or later feel the urge for something radically different. And when they see striking results in other cases, known to be in serious condition, it is but natural they should yearn for similar careful study by the medical man. He must never permit himself to be influenced by the patient's wish. He must not even discuss it with the patient until he has settled the matter in his own mind.

Dr. Nelson and I work out the case thoroughly, do everything possible in a medical way for the patient's recovery and in case of failure we decide for or against surgery before the surgeon sees the case. Dr. Knott then studies the case to determine the surgical risk, method or choice, etc.

The advantages in doing this work at the sanatorium are that the patient does not have to be transported to a general hospital; he feels a psychic comfort in remaining where he has become well acquainted; the regular tuberculosis regime goes right on as before so that he receives appropriate treatment in a delightful environment; he has constant care by nurses and maids whom he knows well and who are very much interested in his progress; and he has the supervision of the physicians who are most familiar with the case. Furthermore, we have the matter so thoroughly systematized that it is less expensive to the patient.

A relatively small group of men represent the early workers in this life-saving plan. The study of the early and subsquent efforts of these courageous individuals is as fascinating as that of the progress of aviation or the exploration of ancient and historic tombs. DeCerenville, Estlander, Brauer, Friedrich, Sauerbuch, Wilms, Tuffier, Jacodaeus, Archibold, Bull, Saugman, Davies, Sayago, Alexander and a few others are the pioneers. Some of them have done a tremendous amount of work, reporting their results in hundreds of cases. These are the men who deserve all the credit for what is being done today. We are but trying to follow in their footsteps.

We have taken your time with this matter only because we hope to create a more definite interest in it, so that we may all learn something and more intelligently do our bit toward the alleviation of this hopeless stage of tuberculosis. Let no man think we flatter ourselves with our puny work. We are grateful for the grand privilege of clumsily attempting to duplicate in a small way the hitherto inconceivable salvage of life which the pioneers have shown us how to bring about.

THE ANATOMY OF OUR SOCIAL LIFE*

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THE FRINGE OF MEDICAL SCIENCE

In my first address I discussed the anatomy of digestion and incidentally showed you a study of emotion. In my second I dealt with the anatomy of growth and introduced you to a time clock. Today a wider interest of the physician impels me to diverge still further from the beaten track of traditional anatomy. I propose to turn aside from the consideration of mere treatment of disease or disability and to take you on an excursion into the half explored fringes of medical science, always so fascinating to the layman, since there his interests and comprehension stand four-square with ours. It is a domain as yet scarcely realized except by the medical officer of health, namely, the application of medical research to social problems.

One may rightfully ask what the anatomist, an exponent of the science of the sepulchre, has to do with social problems. Yet if you will suffer me patiently for a short time, I am hopeful that you will realize what a vital interest the anatomist has in these matters and how much he can contribute to their elucidation.

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* Read before the Sixth Annual Meeting of Pacific Northwest Medical Association, Boise, Ida., June 27-29, 1927.

If you would ask me what I consider the most significant social fact of modern days, I would reply without hesitation that nothing approaches in importance the presence among us of our fathers and mothers. In other words, the prolongation of life in its very general application, which I believe to be of quite modern development, has had the most profound influence upon the social fabric of our time. The crude revision of my thesis which alone, as a rule, gets to the multitude, represents me as insisting that no one really lived to a ripe old age in the past and this naturally calls forth hilarious and fanciful descriptions of Methuselah calling the other ancient men of former days to rejoice with him over the simple minded professor. This is, of course, a gross perversion of my views but, insofar as it affords those who have never seriously considered the matter something to think of, one can afford to smile and pass on. That there were old men in ancient days we all know. When Elihu the Buzite remonstrated with Job, did not the sage turn to his three companions and exclaim, "They that are younger than I have me in derision, whose fathers [fathers, mark you] I would have disdained to have set with the dogs of my flock." Nevertheless the fact that patriarchs did exist and were put forward as they are among native tribes today whenever their accumulated wisdom is sought in bargains to be made or strangers to be received, has no bearing at all upon the point I wish to stress this morning, namely, that more men live to a great age today than ever before.

ESTIMATES OF MORTALITY

It is not the span of life which has been increased; that is definite and unchangeable. It is a function of bodily organization. What has changed is the actual average duration of life as result of improved conditions of living and greater safety. With our modern census records, our mortality tables and vital statistics always to hand, we are apt to forget that in their comparative perfection these are all of recent origin. It is true that Marcus Aurelius instituted the official registration of births in Rome and the Roman provinces, but apart from isolated instances like this there are no extensive records at all of the distant past and what records exist are of doubtful value. Even now birth certificates are often difficult to obtain and surprisingly many people are in doubt about their age. This becomes the more obvious the older people are. From our observations among the lower orders of society I would say it is as common today as it was in Roman times to compute the age in lustra of five years.

Most records of the past consist of contemporary general statements which are either biased or refer to a restricted portion of the community. Or our impressions may be culled even more vaguely from the scant records of the ages at death of a few more notable persons of the time. The only way in which a correct assessment can be made is by wringing the secret from the bones themselves left immutable in the grave.

THE RECORD OF THE DEAD

Yesterday you saw how regularly the closure of epiphyses of the long bones takes place in the nineteenth year. I should like to follow up this theme a little further to illustrate how we use the picture of epiphyseal closure to determine age in adolescence. The method is quite dependable and played its part recently in fixing the age of Tutankhamen at just over eighteen years. From his observations in my laboratory, Stevenson was able to make charts of the dates of epiphyseal union and, since these charts are contrived upon the basis of step-like indicators of the degree of union, resembling the wards of a key, we call them Stevenson's keys. They are comprehensive for the skeleton between seventeen and twenty-three years. The amount of variability is covered by the intermediate keys, showing half stages between one year's record and the next.

In 1916, by the courtesy of the Kelley's Island Lime and Transport Company, I was able to excavate a serpentine mound on Kelley's Island in Lake Erie where were buried summer visitors from the Erie or Cat Nation of Indians. Among the skeletons was that of a young female who died before giving birth to twins. By setting up the records of her epiphyseal union in terms of Stevenson's keys we readily identified her as a girl of nineteen years.

But, of course, the tale unfolded by the epiphyses terminates abruptly at twenty-five years and after that date other criteria must be used. In practice these are many and, but for the enormous amount of dated material available for study in Cleveland (we have now 1500 skeletons of which the records are known), it would have been impossible to ascertain the principle underlying our present practice.

The principle is a textural change which seems to be ultimately related to vascular changes in the bones. This texture change appears to have been recognized in crude form by the medieval Welsh physicians and was used by them in legally evaluating a fractured bone, the result of assault. It is the texture change which results in senile fractures of the femoral neck, in nonpathologic lipping of articular margins and in the tardiness or inhibition of healing of fractures in patients over fifty years of age. By examining the skeletal texture, a procedure inapplicable as yet to the living, we feel competent to decide the age of a skeleton within five years or less of the true age.

Some twenty years ago Karl Pearson analyzed the mortality curve of English males and resolved the complex curve into its simpler components with peaks of mortality at three, twenty-three, forty-two and seventy-two years respectively. We may call these the peaks of childhood, adolescence, middle age and old age. It is the old age peak which is characteristic of modern days. If we take the records of the Roman colonies in Africa, we find an attempt at formation of this peak at the same age of seventy-two years, although its apex is there much lower than that of adolescence. This means that the great majority of African Roman citizens died young, though a minority lived to a considerable age.

When we examine the records of our own laboratory for mortality of white males of the lower strata of society, we find the adolescent and middle age peaks but no old age peak. This is also true of our records for Negro males. It is significant that among the pauper and laboring classes in our Cleveland samples the attainment of old age is even today much rarer than in the classes more financially stable. In 1925, through the kindness of Sir Arthur Keith, I examined the collection of West African Negro skulls in the College of Surgeons Museum. I found the middle age peak of mortality among these native people the same as among our American Negroes and I found no old age peak at all. In the native Tasmanians of the same museum similar results were encountered. From London I went to a Bronze Age burial place in the English Lake District and on this site, among seventeen skeletons, found none over thirty years. From the Lake District I was called across country to Scarborough on the east coast to examine a cemetery of eleventh and twelfth century people. Among the 143 burials the peaks of childhood, adolescence and middle age were readily identified but no old age peak.

After my return home Drs. Kidder and Hooton allowed me to examine the 563 burials at Pecos, New Mexico, covering the period 800 to 1800 A.D. Again I found the peaks of childhood, adolescence and middle age but no peak of old age.

THE INFLUENCE OF OUR ELDERS

This absence of an old age peak in all our primitive and medieval series and also in our modern dissecting room series is an arresting fact. Of course, one may say that we have few old men in our dissecting room series because the old men in that social grade, being unable to stand the rigor of winter here, migrate to other places, like Saint Louis, to die. That may well be true but we cannot thus dodge the issue in other series. Further than this, we know that both in ancient and quite recent times—England under the Stuarts for example—the active age in life was distinctly less than it is generally nowadays. And in America we are going back to the young for control and direction of our industries and government. Indeed, one of the problems of the day is the dissatisfaction of the young with the administration of the elders who, I believe, in their zeal to carry the job efficiently, tend more and more to wear themselves out and die before they should, according to statistical prediction based upon data of the last generation.

When the middle age peak represented the heavy mortality and no old age peak existed, there were were old men alive but relatively few. During the past two or three centuries the increased average duration of life, as shown by our investigations, has permitted us to retain the wisdom and accumulated knowledge possessed by our fathers and uncles. What an impetus to discovery and invention there has been. May it not be due in part, even in large part, to the factor which I am presenting to you? How conscious we have become of the rights of others, of the necessity for safeguarding those who have had no part in government. What legislation in the interests of women, of children, of slaves, of backward peoples. Is it not possible to see in this progress the gracious influence of our mothers, "blooming like evening primroses in the twilight of life"?

I shall leave that theme there, for there is another to which also I wish to direct your attention.

THE FOREHEAD MYTH

People do not like having their heads measured. There is a tacit suggestion that a large head means much brains and that much brains means superiority. Now there may be two flaws in this sequence, but nevertheless I find even children in Junior High School obviously unwilling to have calipers on their heads, and as for medical students, I have never dared to suggest it to them. Karl Pearson did carry it out in Cambridge and nearly staged a riot. This conventional linkage of a large head and especially a high forehead with much brains and superiority of intellect is of considerable antiquity. Paleolithic man was careful to give himself a high forehead, possibly to distinguish himself from the Neandertalers. Durer gives the Christ a high forehead and allocates a low one to Saint Peter in the picturesque meeting on the water of the Sea of Galilee.

As for the brain, Hippocrates called it the metropolis of humidity and Sir Thomas Browne made the quaint notation that, in consequence, skulls are less consumed by fire than other bones. Sir Thomas Browne himself had a low forehead and the most authentic portrait so represents him. But in Elizabethan and Stuart days the high forehead in portraiture became a convention largely due to Van Dyke and, although there was a reaction in the next generation, the impression hung on in men's minds that the high dome-shaped head means brains and therefore intellect.

SEGREGATION OF HEADS

That there is something, however vague, in relation of head size and brain volume is evident from Berry's work in Melbourne, much maligned as that investigator has been. Taking average head size only, there is a distinction between mentally deficient boys and normal boys of the same age. Berry found a difference of 11.6 per cent between the average head sizes of cattle-stealers and anatomists, the advantage being in favor of the latter. The only certain way as yet of ascertaining brain volume or cranial capacity is to measure it directly on the dead body.

By direct determination in the laboratory upon hundreds of male white cadavera we have found that of two heads of the same dimensions, one may have 200 c.c. more brain than the other. By certain statistical methods, into which it is unnecessary to delve, we have been able to distinguish four cranial classes among our cadavera simply on the basis of relation of linear dimensions to capacity. Externally we cannot yet differentiate these classes from each other for, on the average, they all present the same dimensions. Nevertheless, while the lowest type averages only 1307 c.c., the highest averages 1501 c.c. We designate these four classes by the Greek letters α, β, γ, δ, the α skulls being those with least brain volume and the δ skulls having the greatest capacity.

THE PAUPER BAROMETER

While we were carrying out this investigation we also worked out the average male white cranial capacity for successive years from 1913 on. Up to the present we have completed the records until 1925. On charting our results a very striking fact emerged. It is this. During the years 1913 to 1917 inclusive, the average cranial capacity among our male white cadavera was very close to 1480 c.c. Since the average for the white male in general is generally assumed to be about 1500 c.c., we can assure ourselves, having regard to the number at our disposal, that the people who terminate their corporeal existence in the anatomical department are on the average of a subnormal brain capacity. True, there is not a great difference in the averages. Perhaps this is due to the high pressure of modern civilization which does not permit of much deviation, if the conditions of life today are to be successfully met.

But the really remarkable part of this story remains to be told. In 1918 when, as you know, all except the morons either were with the army or engaged in home production, our dissecting room average fell to 1410 c.c. This is below the level of Berry's benevolent asylum adults. In 1919 when after the armistice the army discharged a glut of men upon a civilian community which could not now readily absorb them and much industrial distress thereby ensued, our dissecting room average reached 1520 c.c. This rise above the recognized average gave us pause, but the following year, 1920, the average fell again with increasing prosperity to 1470 c.c.

It was in 1921 that we became alarmed, for then the worst phase of industrial distress set in. Pauperism and destitution occurred such as we had never seen. The Associated Charities were beseiged by multitudes pleading for help. It was then that our average attained the unprecedented level of 1540 c.c., almost the average of the highly intellectual. It is true that the following year this level was not attained and since then there has been a steady fall to the prewar average, concomitant with improvement and stability in industry. Indeed, our average began to fall before the Associated Charities noted the difference for ours is the more sensitive barometer.

Now the investigation had become so exciting that we began to segregate our cranial types by years: the α people, morons, human flotsam and jetsam; the β folk, the pawns of humanity; the γ type, honest, industrious poor with too small a margin for the rainy day; and lastly the δ people, men who can think and argue and persuade but who, from some inherent disability of their nervous system, are unstable and cannot stand the sudden withering blast of misfortune.

Up to and including the year 1917 the majority of our cadavera fell among the α and β classes but in 1918 there were scarcely any but α people. In 1919 the grouping was entirely upset, owing to the increasing number of γ and some δ heads. In 1920 the proportion of these diminished again but in 1921 they poured into the department through the channels of homicide, suicide and drug taking. These are quite different portals from the pneumonia of the shiftless, the heart disease of the strained and the tuberculosis of the overwearied struggler, which had hitherto been the means of filling our dissecting room. But from 1922 onward the balance readjusted itself and now we are once more recruiting our material in the usual manner.

This survey is full of unexplored possibilities. Questions multiply themselves the more we think about the subject. But one fact is sure. Industrial conditions have a marked effect upon the pauper population and are reflected in tangible manner in the anatomical laboratory of a large city like Cleveland. It is not so much the quantity but the quality of brains which matters. It is not the quality of the whole brain so much as the quality of the last three ounces. Upon so little does the balance swing between succcess and failure.

SUMMARY

1. The characteristic peak of modern mortality occurs at seventy-two years, though lesser peaks are encountered in childhood, adolescence and middle life.

2. Among primitive and ancient peoples the middle age peak is highest, that of old age, if it occurs at all, being subsidiary.

3. The inference is that greater safety and improved conditions of life promote the average actual duration of life, though they do not affect the life span itself. It is further suggested that the accumulated wisdom and experience resulting from the existence of a greater proportion of old men today has had a markedly stimulating effect upon recent civilization.

4. The pauper population closely reflects the industrial condition of a city and this is the more obvious in a period of such tremendous social upheaval as that through which we have passed during the last ten years.

THE MINOT AND MURPHY DIET IN PERNICIOUS ANEMIA*

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Last August Minot and Murphy of Boston published an article in which they suggested a new diet to be used in cases of pernicious anemia. Dietary regulation has been the rule in such cases, with little or no positive assurance of definite improvement resulting therefrom. Nor has there been much scientific basis for many of the diets used in the past. Diets low in carbohydrate, diets of high protein, and diets of fresh vegetables have been urged by various writers from time to time. Balanced diets, vitamins, and then liver successively held the attention of investigators.

It is interesting to note, therefore, the theoretical considerations on which this diet is based. We know that adequate proteins, complete proteins, as well as iron, are necessary for formation of hemoglobin. Whipple and his coworkers have demonstrated the value of certain foods, particularly liver, to hasten blood formation following acute hemorrhage. Whipple, furthermore, suggests that in pernicious anemia there may be a scarcity of material from which the stroma of the erythrocytes are formed, or some disorder of the stroma-forming cells of the marrow exists. Theoretically, then, liver and other foods rich in complete proteins may enhance the formation of red blood cells in this disease by supplying the material to build their stroma.

On the other hand, Whipple and other investigators have attributed blood-destroying properties to certain substances derived from fats. A high fat diet is also held to increase intestinal putrefaction, a condition that is not infrequently found in pernicious anemia. Minot and Murphy have noted that many patients suffering from pernicious anemia give a history of consuming large quantities of fatty foods throughout life. Other patients will state that over a period of years they have eaten a diet deficient in some way. From these considerations they reiterate the statement suggested by others that in part, at least, pernicious anemia may be due to nutritional excess or deficiency, or to some vitamin deficiency.

In this respect it is interesting to note that in the same issue of the *Journal A. M. A.*, in which appears the article of Minot and Murphy, was an article by Koessler and others of Chicago, in which they advise a diet very similar in many respects to the one used by Minot and Murphy. The essential difference is the inclusion in their diet of fat in the form of cod liver oil, butter and cream. They include liver, kidney, sweetbread and brain in their diet, as well as large amounts of fruit and fresh vegetables. However, instead of placing any emphasis on the liver, they attribute their success in treating patients with pernicious anemia to the content of vitamin A in the different foods. They produced experimentally a condition similar to human pernicious anemia in animals, and have concluded that blood regeneration cannot take place without the presence of vitamin A, and that the rate and intensity of blood regeneration is a function of the quantity of vitamin A added.

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* Read before King County Medical Society, Seattle, Wash., June 13, 1927.

From Baltimore we have still a third explanation. Less than eight months from the time these articles were published an article by Simmonds, Becker, and McCollum of Johns Hopkins was published, in which they attribute the value of both of these diets to the inclusion of vitamin E. Vitamin E has long been known to contain a reproductive factor. Diets deficient in it produce sterility in male rats, and in female rats, although they become pregnant, there is an invariable resorption of the young. Other investigators have concluded that, in addition to its reproductive activity, there is a lactation promoting factor.

Simmonds and her coworkers believe that vitamin E, in addition to these other faculties, is related to iron assimilation, perhaps comparable to the relation of vitamin D to phosphorous and calcium metabolism. Vitamin E is found in a variety of foodstuffs, mostly in vegetable oils, in extracts of wheat, hemp and cotton seed, It is present in considerable amount in liver fats, rolled oats, polished rice, yellow corn, green kale and lettuce. It is lacking in milk, proteins, cod liver oil, cocoa, linseed and sesame oils.

From the foregoing differences in opinion it is quite evident that the last word has not yet been said as to the precise reason why these patients improve so well under these diets. Minot and Cohn are doing some work, as yet unpublished, that may throw additional light on the subject. They have been utilizing a fraction of liver, less than 2 per cent, that is nonprotein in nature. It is strikingly effective in pernicious anemia, and patients who take but 10 grams of this powder a day improve as rapidly as the cases that took 200 plus grams of raw liver pulp daily.

To return to the diet as originally published, we find large quantities of leafy vegetables and fruits included, not alone for their iron content, although that is considerable, but more emphasis is placed on the character of the amino acids or proteins. The whole diet is rich in iron and in purine derivatives.

Following are the factors of this diet, the amount in each instance being given daily.

1. Liver, calf or beef, 200 grams or more. May substitute occasionally chicken liver or gizzard, or lamb kidney or sweetbread.
2. Fresh fruit, 400 grams. Peaches, apricots, pineapples, strawberries, oranges, grapefruit and raisins are desirable.
3. Red muscle meat, 125 grams. Free of fat, freshly cooked. Beef heart is desirable.
4. Vegetables, 300 grams. Lettuce, young string beans, asparagus, cabbage, tomatoes are good. Avoid corn, parsnips, baked and shell beans.
5. Fats, not over 70 grams. Use little cream and butter. Avoid cheese, bacon and fried foods. Use mineral oil for salad dressing.
6. Avoid grossly sweet foods. Use sugar sparingly.
7. Starchy foods. Cereals, potato, bread, add to suit individual taste but not to exclusion of other items. Best be crusted or dextrinated.
8. Milk. Limit to 240 grams.
9. Avoid excess of salt.
10. Tea and coffee as desired. 1 egg daily. Avoid pork. Broil or bake liver. Eat liver and meat rare.

No medication other than dilute hydrochloric acid was used.

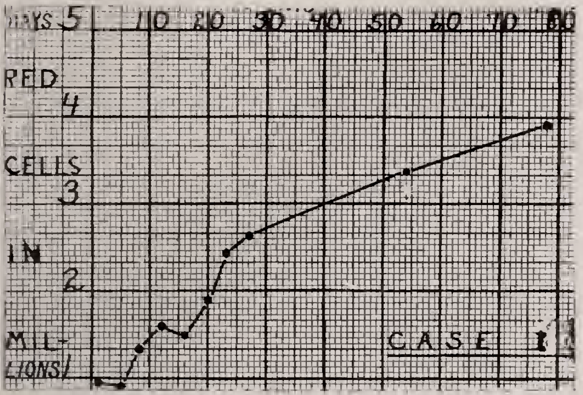
Minot and Murphy placed forty-five consecutive patients suffering from pernicious anemia on this diet. In every instance there was a rapid and distinct remission with improvement of coincident symptoms. Sixteen had had two or more relapses. Nineteen of them averaged 900,000 red blood cells at the beginning of treatment. Taking the whole series, the average red count was 1,470,000 at beginning of treatment; and at the end of one month the average was 3,400,000. Of the twenty-seven cases on the diet for from four to six months the average red cell count was 4,500,000, none being lower than 3,500,000 and 30 per cent having counts in excess of 5,000,000. Most of the patients in this series had only received the diet for about eight months. Some of them, however, had been under observation for a period longer than two years. All remained in good health except three who discontinued the diet, and they rapidly improved after resuming it.

I wish to add a small series of cases to those already reported.

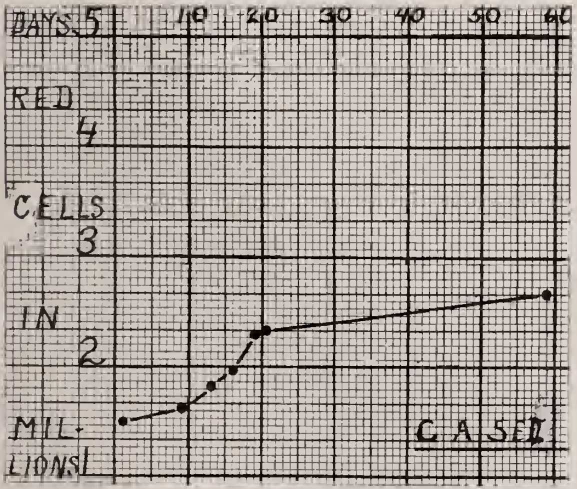
Case 1, male, age 69. For several months he had not been feeling well, and gradually became weaker. His chief complaints were heaviness in his chest and upper abdomen, weakness, diarrhea, numbness of the legs and feet, and cramps in his legs. He was pale, and sick looking, although in a fair state of nutrition. The abdomen was tender and the liver border extended 5 cm. below the costal border. The lungs were negative. There was a systolic murmur of the heart heard best at the apex. The legs were markedly edematous.

He was taken to the Swedish Hospital where he remained four weeks. His blood picture on entering the hospital was: red cells 990,000; hemoglobin 32 per cent; poikilocytosis, anisocytosis, macrocytes, microcytes and a large number of nucleated reds. While in the hospital he was placed on the Minot and Murphy diet and received no medication except dilute hydrochloric acid. There was a steady improvement in his health and strength.

When he left the hospital there were 2,600,000 red blood cells with a hemoglobin of 50 per cent. There were a few macrocytes but no other abnormalities in the blood smear. Eight weeks after the beginning of treatment there were 3,380,000 red blood cells, and the hemoglobin reading was 55 per cent. Three weeks later the red count was 3,900,000 with 70 per cent hemoglobin. After leaving the hospital he was placed on digitalis and the edema and weakness have cleared up.



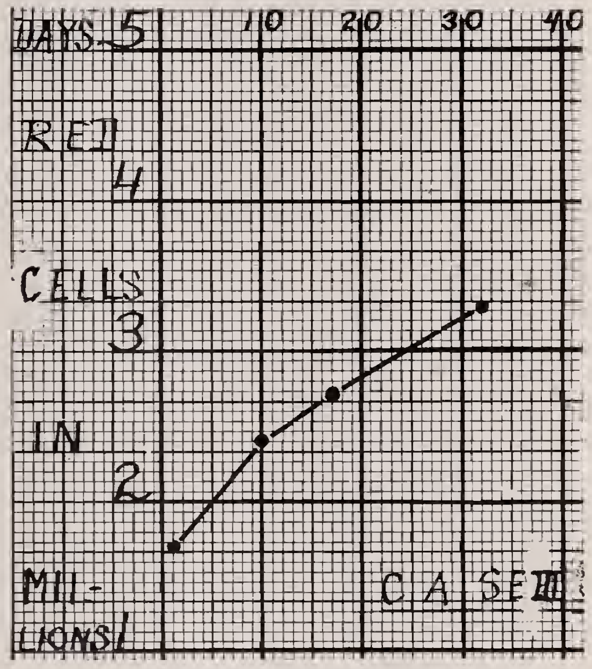
This case is of particular interest, inasmuch as there were well developed cord symptoms at the time the diet was started. At this time he still has some numbness and tingling of the legs but it is not a tenth as severe as it was.



Case 2, female, age 60. For three or four years she had been going down hill. Slept poorly at night and was unable to do the ordinary work about the house that she was accustomed to do. Physical examination revealed a pale obese woman past middle age. Her red count was 1,500,000 with 35 per cent hemoglobin. Anisocytosis and poikilocytosis were present but there were no nucleated reds.

She was taken to Providence Hospital where she remained for two weeks on the Minot and Murphy diet. At the time she left the hospital the red cells numbered 2,310,000 and the hemoglobin reading was 60 per cent. Seven weeks after beginning of treatment there were 2,590,000 red blood cells and the hemoglobin was 70 per cent.

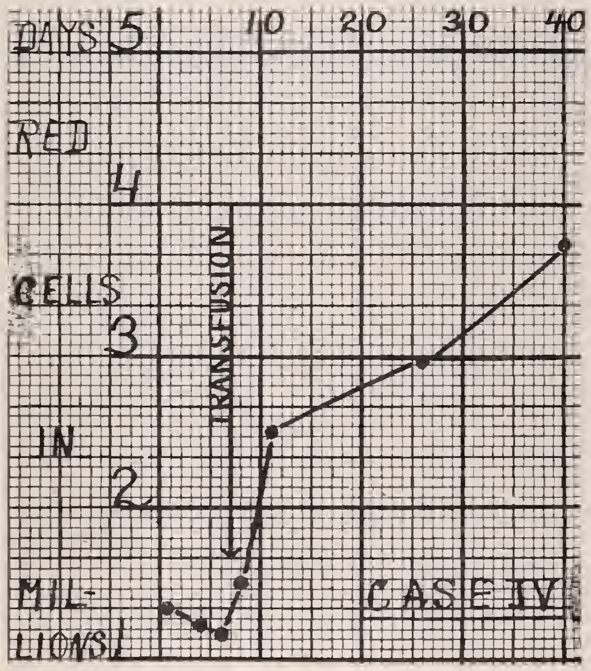
I believe there would have been a more rapid improvement but for the fact that it was difficult for this patient to secure liver daily. Her general condition has greatly improved. She looks 100 per cent better, and is much stronger than before undergoing treatment.



Case 3. This case is reported by permission of Dr. Frank Maxson. Male, age not known. Complained of weakness and inability to do. His blood findings were: red blood cells 1,720,000; hemoglobin, 40 per cent; marked variation in size and shape of red cells, moderate polychromatophilia. After four weeks of a diet of fried liver, once daily, the following findings were noted: red cells, 3,280,000; hemoglobin, 70 per cent; and the only abnormality in the smear were some macrocytes.

Case 4. This case is reported by permission of Dr. Homer Dudley. Female, age 65. This patient had suffered from pernicious anemia for several years. She was in her third distinct relapse, and her condition was much worse than it had been in any of the previous attacks. Her red cell count was 1,350,000 and the hemoglobin was 34 per cent. She had difficulty in taking the liver at first, and like Case 1, for the first five days her count diminished until it was 1,190,000 with a hemoglobin of 28 per cent. At this point she received a blood transfusion of 800 c.c. of whole blood. Immediately after the transfusion she became better, and coincidently was able to take the liver much better than before. She continued to improve and forty days after the beginning of treatment her red cells numbered 3,730,000 with a hemoglobin of 70 per cent.

In this case we cannot give the entire credit to the liver diet. On the other hand, we have never noticed such a marked and prolonged improvement in a case of pernicious anemia following a single transfusion. Several years ago we made a study of the transfusions that were done over a five year period at the Swedish Hospital. While many of the cases of pernicious anemia were greatly improved by such treatment, none made such a striking recovery. In our mind at least, it is a diet which has been the greatest factor in the recovery of this patient.



In three of these cases attempts were made to feed raw liver pulp. Case 1 took it very well, mixed with malted milk and chocolate syrup. When taken this way, it is not unnecessarily unpalatable. Minot and Murphy give it minced fine in orange juice. Case 2 objected to both the malted milk and orange juice, and it was necessary to cook the liver. Case 4 had similar difficulties.

The essential part of the diet seems to be the liver. When the patients neglect this essential, they fail to gain in numbers of red cells and actually lose at times. No medication was given to stimulate blood formation. Dilute hydrochloric acid in rather large doses was given three times a day, in an attempt to enable the patient to digest the high protein diet. From our limited experience in these few cases the only essential is liver, and similar results obtain whether the liver is eaten raw or cooked.

Any improvement in patients with pernicious anemia must be viewed in a very conservative manner. It is essentially a chronic disease lasting some months or years, usually with a history of remarkable remissions. Any form of treatment whatever that is started about the time that a remission is about to occur will naturally be credited with producing the improvement. Minot reported fifty cases in a previous paper with 35 per cent remissions, regardless of what form of treatment was used.

Considering this phase of the subject we must be cautious in giving too much credit to any form of therapy in this disease. On the other hand, this method of treatment has been used for almost three years. Minot and Murphy have an amazing series of forty-five consecutive cases, all showing marked improvement; and reports of similar results are accumulating from other sources. There is no shock to the patient, treatment is inexpensive, and it can be carried out either at the hospital or at home. The results so far have been very promising. It will take a large number of cases observed for a number of years to properly determine whether or not we have a real cure. In the meantime we may well discard the usual unfavorable prognosis, and hold out some hope for improvement to those unfortunates who are suffering from pernicious anemia.

SENILE CATARACT

ITS MEDICAL AND SURGICAL TREATMENT*

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In presenting the subject of the treatment of senile cataract I am not unmindful of the fact that it is one which probably would be of more interest to ophthalmologists than to those whose practice is confined to other branches of medicine.

While ophthalmology as a specialty is very well defined, comprising as it does the surgery and diseases of the eye as well as its refraction and motor anomalies, yet no ophthalmologist of judgment or experience ever considers any of these except in its relation to the whole organism. Except for simple cases of refraction, motor anomalies and minor inflammatory conditions affecting the eye, one is seldom able to complete a thorough and satisfactory examination of any eye without seeking help from either the internist gynecologist, rhinologist, neurologist or all of them.

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

No apology, therefore, need be offered for bringing the subject of cataract to your attention, for in the light of our present knowledge alterations in the structure and character of the crystalline lens are not of themselves pathologic entities but rather are they the local manifestations of some systemic dysfunction. J. Burdon-Cooper, in the Doyne Memorial lecture on the etiology of cataract, states that "subcapsular senile cataract is undoubtedly a chemical decomposition of the lens protein and the trend of opinion now is that it is more acceptable to regard it as due to alteration in the whole organism than to any mechanical explanation based on local causes." Roemer goes further and attributes the changes which take place in the lens as due to toxins in the blood the result of faulty metabolism and considers that subcapsular senile cataract is just as truly a metabolic disease of the lens as, for example, a diabetic cataract.

If the premises upon which these opinions are based are accepted as true, then much can be accomplished by medical and hygienic treatment of incipient senile cataract long before it has progressed to the stage when it is deemed advisable to operate.

It is well to remember that cataract like glaucoma is a disease of middle and advanced life and comes at a time when the organism is feeling the effects of repeated small vices both of omission and commission. Overwork, lack of proper kind and amount of daily outdoor exercise, insufficient relaxation of the mind and freedom from worry, dietary indiscretions, drinking an insufficient quantity of water, poor elimination, all of these are vices, the indulging in which over a long period of years slowly but none the less surely causes changes in the tissues of the body with the inevitable impairment of function.

It is obvious, therefore, that in the treatment of senile cataract plenty of sleep, freedom from worry and a reasonable amount of physical exercise in the open air are of prime importance. More important than all else, however, is proper elimination. This is best attained by a carefully selected diet, combined with mineral oil or agar agar and plenty of water drunk between meals unless there are definite indications against its use.

Though we know in a general way that the lens, having no vascular system of its own, receives its nutrition from the uveal tract through the vessels of the ciliary by a process of diosmosis, precise knowledge as to just how this takes place is wanting. While we are not dealing with those forms of cataract which are definitely secondary to frank disease of the uveal tract, nevertheless any morbid condition in the blood which can impair the role which this structure plays in carrying nutriment to the nonvascular structures of the eye must be considered when dealing with this problem. Although there is no evidence to support the view that there is any direct etiologic relationship existing between focal infection and senile cataract, yet it would seem to be wise to eliminate so far as possible any such source of infection.

A careful and accurate determination of any refractive error should be made and properly corrected with glasses both for distance and near use. That this is essential in retarding the development of senile cataract was shown more than forty years ago by both Jackson and Risley, and is based on the fact that the constant strain involved in correcting these errors of refraction causes the ciliary muscle to drag on the uveal tract and impair its function. That this is not merely of academic interest is proven by Duane's measurement of the accommodative power at various ages. The average individual at seventy-two has more than one dioptre of accommodation which he can and does use.

The patient should be properly instructed in ocular hygiene which should include instructions as to the amount of rest to be taken when reading, and the amount and character of the illumination and the proper distance at which reading matter should be held.

Locally a number of drugs and agents have been employed to delay the process. Boroglycreide, dionin, a combination of sodium iodide and calcium chloride, either in solution used in an eye cup or in ointment form, subconjunctival injections of normal salt or cyanide of mercury solution, radium and lens antigen, all except the last named act by local irritation, bringing fresh blood to the region of the lens and thereby improving its nutrition. Many surgeons have reported very beneficial results from subconjunctival injections of cyanide of mercury.

In a paper presented before the International Congress of Opthalmology in Washington, D. C., in 1922 and a later one presented before the American Ophthalmological Society in 1924, Dr. A. E. Davis of New York City reported a series of 131 cases of senile cataract treated by the subcutaneous injection of lens antigen. The experiments upon which the above work were based were undertaken by Davis twenty-two years ago, using rabbit sera immunized against human cataractous lens and normal guinea pig's lens. Eighteen years later Guyer and Smith succeeded in liquefying the lenses of rabbits and mice in utero by injecting antilens serum into the mother, and the eye defects so produced were transferred into succeeding generations. They were unable, however, to affect any change in the lenses of the mother. This may have been due to the fact that in the fetus a vascular membrane surrounds the lens which disappears at birth and from which the lens receives its nutriment. This, of course, is not present in the adult lens.

If the theory held by Roemer, that cataract is due to toxins circulating in the blood resulting from faulty metabolism, be true, then we can understand, to quote Davis, how the injection into the body of lens antigen extract, which stimulates the body cells to the formation of specific antibodies, which in turn neutralize these toxins of faulty metabolism, can retard or prevent the formation of cataract; and, second, how these specific antibodies formed by the injection of lens antigen act selectively on the decomposed opaque lens fibres (cataract) and cause their liquefication and absorption, thus bringing about a cure of the cataract.

The writer has tried this method of treatment in several cases, an experience far too meager upon which to pass an opinion as to its merits. It seems to be well worth using in selected cases. Its field of usefulness, however, is limited to those lenses which show a diffuse haze, those which are characterized by spicules or riders, extending in from the equator and in certain forms of cataract secondary to uveal disease. In immature, mature and nuclear sclerosis of the lens nothing but operative measures can effect a cure.

The surgery of senile cataract is so large a subject that the scope of this paper will not permit of more than a cursory discussion of several of its phases. Therefore, in order to make my remarks as concise as possible I shall divide them into two parts, one to deal with the time to operate and the other the kind of operation to be performed.

For many years it was the accepted practice to wait until the cataract was ripe before operating. This was based upon the knowledge that, if the capsule of an immature cataract were opened and the nucleus and cortical matter expressed, almost invariably much of the latter as well as the torn capsule with its attached epithelium were left behind. In consequence a secondary capsular cataract remained which frequently was far more difficult to handle than the original cataract. If operation was delayed until the disintegration of the lens fibers was complete, it was found that by slitting the hyaline capsule of the lens, which never becomes opaque, with a cystotome, the lenticular substance could be expressed completely, leaving practically no secondary capsular cataract with which to deal.

Several improvements in the technic of the operation, of which I shall have more to say later, have made it possible to operate successfully long before the cataract becomes ripe. Obviously this is of enormous economic value to the patient for not all patients with cataracts are dependents.

As an example, let me cite the case of a woman forty-five years of age upon whom I operated about three months ago. The vision was reduced to 20/100 below the point where she could read or carry on her work. No one, of course, could have predicted when her cataracts would have been mature but at the rate they were developing it would have been at least several years. Mentally, she was beginning to lose her grip on herself. One cataract was removed, normal vision obtained and with it the ability to read the finest type.

Within a few weeks I shall operate on the other eye. Needless to say, her whole outlook on life has changed from despondency to cheerfulness.

Another case was that of a man, forty-four years of age, whose corrected vision in both eyes was 20/200, almost industrial blindness. This man was the father of a family and was told that nothing could be done for him until the cataracts were ripe. He had immature cataracts in both eyes.

I operated upon him two years ago. His corrected vision after operation was 20/20 with the right eye and 20/50 with the left. An examination within the last week shows that his vision is still as good as it was immediately after the operations.

When an individual reaches the age at which cataracts usually develop, reading and card playing are his greatest recreations. If the ability to do either of these is taken away from him, life becomes irksome, to say the least, and he is very liable to become introspective.

It is my practice to operate if vision has fallen to 20/80. Below this point it is very difficult, if not impossible, for anyone to read ordinary printing with comfort, and in my opinion operation is justifiable. I have never had any occasion to regret doing this, for it certainly saves these patients many months of semiblindness.

Few physicians are unfamiliar with the fact that, due to the writings and work of Col. Henry Smith, the intracapsular method of extracting senile cataract has been brought to the attention of the ophthalmic profession. Smith's enormous experience, over 50,000 extractions, interested a number of surgeons from this country to such an extent that they journeyed to India to learn at first hand the technic of his operation. Later Barraquer of Barcelona perfected a method first devised by Hulen of San Francisco, whereby the lens and its capsule were drawn out of the eye by means of a suction cup. Knapp and Torek of New York improved Smith's procedure and made it safer.

There has been quite a controversy not only between the proponents of the various intracapsular operations but also between those who advocated this method and those who favored the older capsulotomy method. No matter what the opponents of this method of operating may say to the contrary, it is undoubtedly true that there is much less inflammatory reaction and the eye heals quicker after an intracapsular extraction than after a capsulotomy operation. However, it is also true that the former is a much more risky operation than the latter.

There are certain types of cataracts in individuals over sixty years of age, where the Knapp operation is quite justifiable and need not be any more dangerous to the integrity of the eyes than the capsulotomy operation, but after having tried them all I am of the opinion that, taking these cases as they come, the visual results will be as good with the capsulotomy as with the intracapsular. This is due largely to the improved technic in removing the anterior capsule of the lens.

After the iridectomy is made, specially shaped capsule forceps are introduced into the anterior chamber, carried across the anterior chamber in front of the lens, their tips are passed between the lower border of the iris, spread out and a large bite of the anterior capsule is removed and usually considerable cortical matter with it. After the nucleus is extracted the remaining soft matter is washed out with normal salt solution. Following this technic there is no danger of dense secondary capsular cataract forming later on.

There are two points in technic deserving of mention and which I have been using for the past five years, namely, the blocking of branches of the seventh nerve which enervates the orbicularis to obviate the voluntary and involuntary squeezing of the lids and the conjunctival suture. I have repeatedly demonstrated to my own satisfaction that the use of this technic has immeasurably simplified the operation for me and made it safer for the patient.

In nervous patients an intraorbital blocking of the ciliary ganglion will make the operation absolutely painless. The conjunctival stitch gives the operator a sense of security which amply repays him for the time and trouble it takes to insert it. I can recall one case that was saved from marked loss of vitreous because of its use.

In closing, I should like to refute an impression which has seemed to be prevalent to the effect that, in order to be able to successfully operate on a cataract before it is ripe, the operator must of necessity use one of the intracapsular operations. This is certainly not true. By blocking the lids, using a conjunctival suture, abscising a large central portion of the anterior capsule and removing as much as possible of the remaining soft cortical matter by lavage, it is possible to secure as satisfactory a result with less danger to the patient, as can be obtained by any intracapsular operation.

NONSPECIFIC URETHRITIS IN THE MALE *

W. Ray Jones, M.D.
SEATTLE, WASH.

Nonspecific urethritis is almost as frequent as specific or gonococcic, and yet almost ignored as a clinical entity. Office records show but sixty per cent of those males seeking medical attention, with a self-made diagnosis of gonorrhea, really have this condition. The real causes of the urethritides varied in gravity from a guilty conscience to cancer.

The percentage of gonococcic urethritis varies inversely with the intelligence of the individual. Guilty consciences are quite common among the intelligent. With the lower strata the man seeks treatment not because of the gonorrhea but because of the painful complications, as dysuria, epididmitis, stricture closing, curtailment of his sexual activities and the like.

The term nonspecific is a misnomer. Every urethral discharge has some specific cause. Efficient treatment must necessarily depend upon finding the cause or several interrelated causes. The two main divisions are bacterial and nonbacterial. The nonbacterial may have a secondary bacterial infection superimposed, as in the case of a saprophytic germ living on a noninfected discharge.

The commonest of all nonbacterially infected urethritis is dependent upon a guilty conscience. After an exposure the man becomes conscience-stricken and looks for trouble. Persistent squeezing will induce a discharge from any urethra. If a strong prophylactic injection has been used, or alcoholics have been partaken of, the discharge is more, and in the patient's mind the diagnosis certain. The rubbing of clothing against the meatus, particularly if unclean, may induce inflammation. Mas-

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* Read before King County Medical Society, Seattle, Wash.

turbation provokes both bacterial and nonbacterial inflammation. Mechanical irritation increases any normal secretion. Saliva, so often used for lubrication, may transplant various microbes on to a traumatized epithelium.

Prophylactic injections are a most common cause of medicinal urethritis. Protargol is the chief offender. Other prophylactics are without number. A most novel one is the injection of pure lemon juice, as practiced among seafaring men.

Many drugs, when taken by mouth, will induce an urethral inflammation. Alcoholic drinks are the most common. Capsicum taken as a cold remedy, or an excessive amount of pepper in food, may set up a severe burning and a watery to purulent discharge. Turpentine and partially oxidized balsamics may all induce irritation of the entire urinary tract.

A normal urine is of the right acidity, viscosity, etc. to retain all solid constituents in solution. Changes in diet, faulty metabolism or deficient elimination may change the acidity to the point of its being irritating, or concentrate the urine till the salts precipitate. Disturbed peace of mind may alkalinize the urine to such an extent that the great quantity of precipitated phosphates become exceedingly irritating. Faulty diet may so acidulate the urine that urate and oxalate crystals scratch the urethra to a point of inducing pus formation.

Any of the acute exanthematas, as measles, may give rise to an urethritis that is self-limited. These are unnoticed, since the patient has too many other troubles to observe an urinary burning or slight watery discharge.

There is a small amount of continuous natural secretion from the normal sexual glands. The urethral secretion serves as a buffer against the irritating urine and drains off with each urination.

The excessive accumulation of secretion from the prostate and vesicles may drain off slowly with the urine, or in volume in the form of an emission. An individual straining at stool or urination sometimes is horrified to find a drop of what looks to him like a return of an old gonorrheal discharge. This is nothing more than the normal sexual gland overflow, forced out by the straining.

Following infection or pathologic irritations of any of these glands there is an oversecretion of a natural fluid. The urethral glands are the *worst* offenders. Sometimes a mucous discharge persists long after the primary inflammation is relieved.

Sexual excitement ungratified may induce an outpouring of mucus from the urethral and other glands in sufficient quantity to soil the clothing. Picture a prospective bridegroom discovering his underwear soiled after an evening with his fiancee, all excitedly demanding a speedy cure of an old gonococcic return.

Ordinary venereal warts may invade the urethra and be the basic cause of a discharge. If these attack the bladder, they eventually become malignant. Tumors in any part of the urinary tract from the kidneys down have been the cause of pyurias, often diagnosed as gonorrhea by the laity.

Urinary flow retardation, without the retention symptoms, is very prone to cause a discharge. Any narrowing of the urethra acts as a dam, holding a puddle of urine behind it. No change in stream is noticed, since the meatus is naturally the smallest part of the canal. If these narrowings are merely swellings of the urethra, there may be symptoms of tenderness at the location of resistance.

Benign papillomata of the urethra are microscopically similar to the ordinary external venereal warts. Location is principally in the fossa and bulbar urethra. Discharge is watery and more often sterile. Of course, they are secondary to some other pathology.

Chronic urinary retention, complicating paralysis, always entails an urethritis. The paralytic need not be catheterized. The urinary infection will come. The thing to hope for is that it be a colon microbe, such as will inhibit the growth of more pathogenic organisms. The tabetic, or any one suffering from cord injuries, will have the same urethritis in varying severity and it will continue till the urethra changes to a rather tough squamous, epithelial tube instead of the natural resilient one.

Most any shaped microbe, parasitic or saprophytic, may grow in the urethra. Sometimes other microbes are superimposed upon a low grade gonococcic infection or various bacteria are present in symbiosis.

The colon bacillus, next to the gonococcus, is the most common invader of the urethra, but will not invade a normal epithelium. There must be another primary infection or some trauma. When the organism invades the bladder as well, we frequently find it of such low virulence as to show hundreds or perhaps thousands of microbes to a few pus cells. With streptococci, on the other hand, it is many pus cells to a few germs. Staphylococcic infection is given to quickly extending into the bladder. Then we find free microbes in the urine and in greater numbers than with the gonococcic infection.

The most perplexing urethritis of all is the one with a staphylococcus that becomes intracellular. Too energetic decolorizing may free the organism of stain and give a gram-negative. The same slide may show intra- and extracellular diplococci that are both gram-negative and gram-positive. The question then resolves into, is it an involute form of an old gonococcus or a staphylococcus or both? Homes have been wrecked by deciding this wrongly.

Primary syphilitic urethritis is a picture entirely different from any of the others. The urethra is pouting, foreskin edematous, discharge profuse and serous, not purulent. This discharge may show but a few pus cells and no bacteria; spirochetes are not always easily obtained. There may be no adenopathy, as the urethral mucosa drains into the pelvic more than into the inguinal lymph glands.

Secondary syphilitic urethritis is unnoticed by the patient because of being outshone by the other symptoms. Tertiary luetic urethritis is more frequent than recognized and gives the same symptoms as ordinary stricture or chronic inflammatory patches.

True chancroid, phagedenic ulcer, and the fourth disease with a Vincent's infection, all may invade the urethra. Should the foreskin be long and phymosis ensue the true nature of the infection cannot be learned without a dorsal slit. These discharges are more watery than purulent. The microscope will quckly diagnose a Vincent.

A word of caution jut now regarding laboratory tests. Commercial laboratories give little idea as to the relative amount of pus, epithelium and mucus, or as to whether bacteria are large, small, inside or outside of cell, single or in clumps, whether cellular elements, well preserved or broken down. To successfully diagnose and treat nonspecifics, one must either examine his own slides or have a laboratory at hand where he can at times see the characteristics of the microscopic field for himself.

All cases of tuberculosis of the urinary system have some urethritis, if no more than that induced by the highly acid urine. Unless strictures are formed, the patient notices nothing and the physician sees only the upper tract conditions. Bacteriologic diagnosis is complicated because of the smegma bacillus.

A long foreskin harbors a multiplicity of microbes, any of which may cause an urethritis. Vincent's symbiotic bacillus and spirochetes grow very well under a long foreskin without inducing an open ulcer. The symptomless Vincent infection is a mark of distinction of the masturbator.

Condoms may carry infection. The "fish skin" is the cecum of a sheep, always infective and at times with organisms producing a most persistent urethritis.

A slight degree of hypospadias forms a meatus that is in the fossa navicularis, a wide part of the canal. With this condition there is no nozzle. Distention of the urethra on urination is lacking. Hence an infection is not washed out. The clothing will rub against the meatus more and thus produce a very fertile field for a beginning urethritis. Occasionally this irritation causes the meatus to grow smaller and, instead of a wide open slit, there is a pinhole meatus.

Some women's vaginal secretion is very irritating, even to the inducing of an external dermatitis on themselves. Combine this with a saprophytic organism and, while she herself has acquired an immunity, her sexual partner will acquire a nonspecific infection.

The prostatic and ejaculatory duct openings may be incompetent and a slight but continuous draining of seminal fluid takes place. Misplaced duct openings are seldom competent. It is entirely too common to find the ureter and ejaculatory duct having a common opening, and this in a bladder or urethral diverticulum.

Postcatheterization urethritis can be explained on the basis that the urethra if uninjured is very resistant to all infections other than gonococcus. No amount of scrubbing will completely sterilize the meatus, and no catheter will pass without doing some injury. The result is eventual infection.

Some occupations are more prone to urethritis. Analin workers are subject to scrotal eczema and nonspecific urethritis. Some nationalities are more subject to urethritis. Southeast Europeans in the United States can almost call it a national disease.

If we call gonococci specific, and all others nonspecific, there is such a thing. Remember, however, there is some specific cause for all and efficient treatment must rest on finding this cause or series of interrelated causes and instituting appropriate therapeutics.

332 Cobb Bldg.

PYELONEPHRITIS AND ITS RELATION TO NONGONORRHEAL URETHRITIS. From the evidence presented by B. C. Corbus, Chicago (*Journal A. M. A.*, Dec. 24, 1927), it appears that many cases of nongonorrheal urethritis of bacterial origin occur as a result of infections carried from within out and not from without in. The results of divided urine cultures and pyelographic studies show that pyelonephritis as a result of focal infection, with poor kidney drainage, is often the cause of persistent nongonorrheal urethritis. Treatment should include removal of focal infections and the establishment of adequate kidney drainage.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington and Idaho
Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

JANUARY, 1928

EDITORIAL

A QUARTER CENTURY'S EXISTENCE

With the close of last year NORTHWEST MEDICINE ended twenty-five years of continuous monthly publication. Any institution which has survived the vicissitudes of a quarter century is justified in a feeling of satisfaction and a degree of self-congratulation. The management of this journal reviews this lengthy period with contemplations of this character. Since many of our readers are unfamiliar with the early history of the journal, a recital of some of the experiences connected with its origin and development may be of interest.

At the beginning of the century the physicians of Seattle commonly and frequently deplored the absence of any institutions or organizations promoting medical study and research endeavors. There had been an attempt to establish a medical library, but the books assembled were consumed in the fire which destroyed the public library. In 1902 a group of physicians discussed the advisability of establishing a medical journal which might serve as an inspiration to the profession of the state in the exercise of careful study, with the prospect of publishing their papers, and it was believed the medical literature collected from exchange journals and books of review would serve as a nucleus for a library. In January of the folowing year NORTHWEST MEDICINE was launched on its career under the auspices of the Washington Medical Library Association, with the editor and business manager who have served to the present day. Starting with no capital and an editor with no previous experience whatever in this line of work, the first few years were beset with difficulties and many unexpected experiences. Nevertheless these were met and overcome as they appeared, while they gradually diminished in importance as the years went by.

In 1909 several Portland physicians suggested the formation of a tristate organization, combining the state associations of Oregon, Washington and Idaho, with arrangement for a common meeting to be held every three years, rotating among the three states. At the same time it was provided that NORTHWEST MEDICINE should be the official publication of this organization. The first combined meeting was held in Seattle in July of that year. In the following August the first issue of the journal appeared in its present form and size, the previous publication having been smaller with one column to the page. With this change of form a new volume was begun, so that the issues of that year consisted of two, which accounts for the fact that the volume of the past year is numbered XXVI. The journal has been issued regularly each month with little variation in the number of pages except during the war, when the governmental restriction on the use of paper compelled a material reduction for part of a year. At the same time a printers' strike suspended publication for three months but the numbers for this period were later provided.

With the closer relations of the physicians of the three states, the journal was placed on a recognized basis, by reason of which it has ranked with the association journals of the other states. Soon after this time the financial situation became established on a firm foundation through the formation of the Cooperative Medical Advertising Bureau of the American Medical Association, which was organized for the purpose of obtaining advertisements for the different state journals. This has done much to relieve financial anxiety and worry which commonly accompany publications of this character.

The editor of this journal reviews the labors of the past quarter century with feelings of pleasure and satisfaction. His relations with the profession of the states which the journal represents have been cordial and harmonious. The papers published during this period have demonstrated that the physicians of this section possess professional accomplishments and literary qualifications that will compare favorably with those in any other part of the country. For the courtesy and confidence they have extended toward him in the editing and publishing of the journal he wishes to make grateful acknowledgment, as well as an appreciation of their consideration for any shortcomings and disappointments which have been evident in his work. While he does not anticipate duplicating this period of editorial work, he trusts that it may be prolonged for a reasonable period in the future.

A VICIOUS TUBERCULOSIS NOSTRUM

A letter directed to the editor has been received from an individual in Pasadena, Calif., extolling the virtues of a sure cure for tuberculosis, originated and exploited by Dr. George Kirkpatrick, a veterinary of Portland, Ore. The letter was accompanied by a lengthy communication from Mayor Baker, directed to the Portland City Council, in which he endorses all the claims announced by Kirkpatrick for the curative powers of his remedy, the "Body-building Fluid," which sells at $10 a bottle.

The marvelous results said to be obtainable from this nostrum are based on the cures claimed to have been observed in its administration to tuberculous cows. After a period of several months, when these animals were slaughtered, no trace of tuberculosis could be found in two cows, while it had so decreased in several others that they were passed by representatives of the United States Bureau of Animal Industry as fit for human consumption. The mayor's communication elaborates experiments of this nature, on the strength of which it is asserted similar results are expected in human tuberculosis, although illustrative cases are not cited.

This nostrum is nothing new. Nearly two years ago, under the designation "Pul-Bro-Tu," it was analyzed by the Council of Pharmacy of the American Medical Association and the information published in the Journal that it is a weak solution of arsenic in potassium iodide. Anyone with the slightest knowledge of tuberculosis will recognize that such medication can have no effect whatever on tuberculous infection. Kirkpatrick's observation that no evidence of tuberculosis was discovered in two previously tuberculous cows is of no significance, since it is a well known fact that in ten per cent of cattle, positive reactors to tuberculin, the autopsy reveals no evidence of the disease. Moreover, seventy-five per cent of all cattle who are positive reactors, when slaughtered are passed as fit for food by government inspectors.

Patients treated by Kirkpatrick have not been subjected to physical examination and many without tuberculosis have been given this treatment. It is stated that the Portland Free Dispensary has the names and addresses of sixty-three pateints who have died while taking this nostrum, being assured that they were taking a specific for pulmonary tuberculosis. In fact, some of them were informed by Kirkpatrick that they were cured of the disease.

This preparation is not being exploited for the first time, it having been offered for sale for more than fifteen years. Of late a company has been organized to force the sale of this so-called remedy. It is composed in part of certain politicians, through whose influence propaganda has recently appeared in the newspapers. Through the same agency it is stated that names of tuberculous patients have been obtained from the files at the City Health Bureau, to whom circulars have been addressed endorsing and recommending this nostrum. Anyone with a soul for the interests of suffering humanity will agree that such an outrageous exploiting of this class of patients should be exposed in no uncertain terms to the condemnation of public opinion. Public officials, who will prostitute their influence for the acquirement of dollars by thus imposing a useless remedy on sick people, many of whom might be relieved by rational methods of treatment, deserve the publicity commonly accorded other exhibitions of nefarious activities.

MYSTERIOUS POLIOMYELITIS

Gradually the problems of contagious diseases are being solved and the possibility of the elimination of one after another becomes evident through the discovery of the causative microorganisms, and the elaboration of sera for their prophylactic control. Anterior poliomyelitis remains as one of the baffling diseases, whose mystery is yet to be solved. Though several noted investigators have isolated different organisms that almost seem to fill the requirements as the causative factor, none as yet has been accepted as the established cause of the disease. Judging from the facts which have been developed in the study of other epidemic diseases of childhood, it is reasonable to presume that the unknown factors concerning this disease will some day be revealed to the industrious research worker.

From a study of the records of the recent epidemic, certain interesting facts are to be noted. It is learned that some cases are reported practically every month of the year. Reviewing the records of this disease for many years, it is noted that it becomes epidemic every three years. Appearing without variation during the months from August to November inclusive, it may extend into December. Thus in Washington, during the first seven months of last year eight cases were reported, while 234 appeared during the next four months. For some unexplained reason Oregon reported more cases than Washington, its record being 322 cases. One of the mysteries of this disease is its changing localities of maximum development from one epidemic to another. During the recent epidemic an excess of cases was found in Southern Oregon near the California border, associated with a large number of cases from the northern counties of the latter state. Thus Klamath county reported 68 out of the 322 cases for the state. A similar unexplained condition was noted in Washington, the city of Tacoma reporting 83 of the 234 cases of the state.

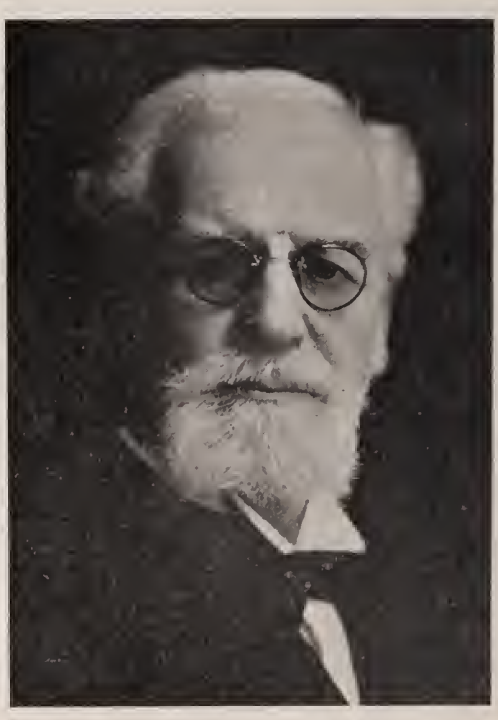
Regardless of the line of treatment followed, the mortality has remained about the same from one epidemic to another. It continued true to form in the recent epidemic in the two states under discussion, the mortality being about twenty per cent, records for a number of epidemics in the past varying little from this. Based on the incidents thus observed, there will be reason to anticipate another epidemic of this disease in the year 1930. In this discussion no attempt is made to explain the facts observed nor any suggestions for their prevention. It is well, however, to keep these facts in mind for future reference.

SIMEON EDWARD JOSEPHI, M.D., LL.D.

The Fifteenth Annual Meeting of the Alumni Association, Medical School, University of Oregon, will convene in Portland, January 12 and 13, 1928, in joint session with the S. E. Josephi Jubilee Meeting, honoring the semicentennial of the entrance into medicine of that justly famous physician. Dr. Josephi was born December 3, 1849, and received his degree in medicine from the University of California Medical School, in 1877. He then became associated with Dr. Hawthorne who had charge of the Oregon state insane patients and in 1881-83 he served as medical superintendent of the Oregon State Insane Asylum which was then in Portland. In 1886-87 he was superintendent of the Oregon State Hospital which had been transferred to Salem. For a time he taught anatomy and neuropsychiatry in the Willamette Medical College. He was one of the founders of the University of Oregon, Medical School, in Portland, and its first dean. For twenty-five years he presided over its destinies, resigning in 1912. During most, if not all, of this time he taught nervous and mental diseases and obstetrics.

During the fifty years of his practice Dr. Josephi has held a multitude of positions of trust. He served as president of the Oregon State Medical Association, was first president of the Portland City and County Medical Society, and first president of the Portland Academy of Medicine. In fact, almost every position of honor within the gift of the physicians of Oregon has been conferred upon him at one time or another. He belongs to the Association of Visiting Physicians of the Good Samaritan Hospital and for thirty-seven years has been a member of the Board of Trustees of that institution. He is a Fellow of the Americal Medical Association. Prior to the war he was a first lieutenant in the Medical Reserve Corps. During the war he was a chairman of an advisory board.

Outside of the realm of medicine he has performed many other duties and has had many honors. Among others he was a member of the Board of Pardons of the State of Oregon for a number of years, a member of the Port of Portland from 1881 to 1886, a member of the Portland Water Board from 1877 to 1906 and of the Oregon State Senate in 1899-1900. He has been a vestryman of St. Davis's Episcopal Church since the "memory of man runneth not to the contrary," to quote his own language, and is now and for many years has been its senior warden. Perhaps the greatest honor which he has as yet received was the degree of LL.D. which was conferred upon him in June, 1924, by the University of Oregon, "in honor of services in the cause of medical education in the Pacific Northwest."


DR. SIMEON E. JOSEPHI

When Dr. Josephi resigned as dean of the University of Oregon Medical School, the Portland Academy of Medicine gave a dinner in his honor, November 6, 1927, an even larger similar function was scheduled for him by the Association of Visiting Physicians of the Good Samaritan Hospital, the latter corresponding quite accurately with the fiftieth anniversary of his graduation. He is still very much alive and well, vigorous, alert and active in his profession. He seems to defy time's ravages and whenever he is needed, whether for the care of patients or at some meeting, he is always promptly on hand and ready to give freely and generously of his wisdom. By his great unselfishness, his extraordinary industry, his upright character and uniformly righteous conduct, he has achieved deserved laurels which he wears with a modesty that belongs only to the great. In honoring him, the Alumni Association of the University of Oregon Medical School honors itself and through his presence provides an inspiration to its members. NORTHWEST MEDICINE, too, feels privileged in being permitted to record just a little of his biography and hopes that it will be able to share with him many more anniversaries.

UNIVERSITY OF OREGON ALUMNI ASSOCIATION MEETING

The fifteenth annual meeting of the Alumni Association, Medical School, University of Oregon, will be held at Portland, Ore., Jan. 12-13, in connection with the monthly meeting of Portland Academy of Medicine. This will also be the S. E. Joseph jubilee meeting. The following program will be presented.

JANUARY 12

8:30 A.M.—Clinics, Multnomah County Hospital

Dr. Otis F. Akin—Fractures.

Dr. J. Earl Else—Surgical.

Dr. David Baird—Medical.

1:30 P.M.—Papers, Portland Hotel

Dr. Morris L. Bridgeman—Systemic Disease in Children Due to Focal Infection.
Discussion, Dr. John W. McCollom.

Dr. J. Allen Gilbert—Somnambulism.
Discussion, Dr. Albert A. Witham.

Dr. H. H. Foskett—Observations on Hay Fever in the Willamette Valley.
Discussion, Dr. Edmund W. Simmons.

Dr. O. Miller Babbitt—Newer Facts Regarding Herpes with Special Reference to Herpes of the Cornea.
Discussion, Dr. Harry M. Bouvy.

Dr. Warren C. Hunter—Regeneration of Tubular Epithelium in the Human Kidney Following Injury by Mercuric Chloride.
Discussion, Dr. Franklin P. Johnson.

Dr. Ernest A. Sommer—Use of "Three-Piece Cast" in Reducing Fractures of the Extremities.
Discussion, Dr. Leland V. Belknap.

Dr. Harold C. Bean—Streptococcus Septicemia.
Discussion, Dr. Charles H. Manlove.

MEDICAL NOTES

OREGON

TUBERCULOSIS CURE DENIED. Drs. Beckwith and Traum of the Department of Bacteriology at the University of California, Berkeley, Calif., have submitted to Dr. W. H. Lytle, Oregon state veterinarian, an official report of their recent investigation of the Kirkpatrick tuberculosis remedy. Their experiments, which were confined to cattle, failed to justify Kirkpatrick's claim that his preparation is a cure for bovine tuberculosis.

HOSPITAL ADDITION COMPLETED. An addition to the Hutchinson hospital at Enterprise has recently been completed at a cost of $8000. This institute was founded in 1922 by Mrs. Ida Hutchinson.

LANE COUNTY MEDICAL SOCIETY, at a meeting at Eugene Nov. 29 entertained Dr. Corneille Heymans, a native of Belgium. He addressed the society on "The Effect of Thermal Changes on the Heat Regulating Mechanism of the Body."

DR. E. E. BAIRD has moved from Newberg to Heppner, where he will engage in practice.

DR F. C. BROSIUS, formerly of Wallowa, has opened an office at Hood River.

MEDICAL WEDDING. Dr. Paul W. Sharp and Miss Elizabeth Mueller, both of Klamath Falls, were married Nov. 24.

WASHINGTON

ENLARGEMENT OF VETERANS' HOSPITAL. Senator Wesley L. Jones of Washington recently introduced a bill in the United States Senate which, if passed, will provide for increased facilities at the American Lake Veterans' Hospital. According to the plans incorporated in the bill the institution would be converted from a neuropsychopathic hospital to a general medical and surgical hospital. The enlarged hospital would be able to care for 350 additional patients.

HOSPITAL FACILITIES INCREASED. The interior construction of the north wing of St. Joseph's Hospital, Tacoma, has recently been completed. It provides space for the administrative offices as well as the maternity and infant wards.

HOSPITAL DEDICATED. The new Port Angeles Hospital and Sanatorium was formally dedicated by Governor Roland Hartley Nov. 26. The hospital is strictly modern and will accommodate one hundred patients. The superintendent is Miss Jessie F. Mackenzie, R. N., formerly superintendent of the California State Woman's Hospital, San Francisco, Calif.

RESIGNS FROM INDIAN SERVICE. Dr. Fred Barteau, for the past two years physician in charge of the Fort Spokane Indian Reservation hospital at Miles, has resigned. He intends to engage in private practice at Spokane.

SCHOOLS CLOSED BY SMALLPOX EPIDEMIC. Following the development of approximately fifteen cases of smallpox in Walla Walla during the month of December, the public schools were closed by order of Dr.

George H. T. Sparling, county health officer. Readmission to school was made only after the demonstration of a successful vaccination. The public schools of several of the surrounding towns were also closed on account of the epidemic.

Sea Food Workers to be Examined. Dr. E. T. Hanley, Seattle health commissioner, has announced that his department has secured the full time services of a physician for the purpose of making periodic health examinations of oyster openers, shrimp and crab pickers, and others engaged in the handling of fish and shell foods in Seattle.

Symposium on Tumors. The staff of St. Mary's hospital, Walla Walla, devoted its meeting Dec. 2 to a symposium on tumors of the colon. Among those participating in the program were Drs. J. C. Lyman, C. J. Johannesson and A. E. Lang.

Whatcom County Medical Society held a meeting at Bellingham December 12. Dr. Conner O. Reed, retiring president of the society, presided. The election of officers for 1928 resulted as follows: President, Dr. L. P. McCalla, Bellingham; first vice-president, Dr. G. N. Belyea, Bellingham; second vice-president, Dr. C. C. Hills, Custer; third vice-president, Dr. Marion Keyes, Blaine; secretary, Dr. W. B. S. Thomas, Bellingham; treasurer, Dr. J. R. Morrison, Bellingham.

Snohomish County Medical Society held its annual meeting at the Everett Golf and Country Club Dec. 6. Fifty physicians from Snohomish county and a number of out-of-town guests attended. Dr. W. D. Smith, Everett, president of the society, acted as toastmaster. Addresses were made by Drs. C. A. Mead and W. C. Cox of Everett.

Walla Walla Valley Medical Society at a meeting at the United States Veterans' hospital, Walla Walla, was addressed by Dr. R. A. Gunter on the subject of "Bronchiectasis."

Thurston-Mason County Medical Society held a meeting at Olympia December 16. A paper entitled "Differential Diagnosis of Chronic Appendicitis" was read by Dr. C. W. Jones of Olympia.

Seattle Orthopedic Club. The annual meeting of the club was held on December 6, 1927, at Virginia Mason Hospital. An interesting address was given by Dr. C. F. Davidson on the "Influence of Internal Secretions on Many Pathological Changes in Bone."

The following officers were elected for the coming year. President, Dr. Donald A. Murray; vice-president, Dr. Joe Brugman; secretary-treasurer, Dr. R. L. Jeffery.

Heads Surgical Society. At the recent annual meeting of the North Pacific Surgical Society, Dr. Charles B. Ford of Seattle was elected president for 1928. The next annual session is to take place in Seattle next December.

The Annual Clinics and Banquet of the Seattle Orthopedic Club will be held on February 24 and 25. Dr. H. Winnett Orr of Lincoln, Nebraska, will be present and will give some clinics on demonstrations on the subject of fractures and on the treatment of osteomyelitis. Fuller details will be announced later.

Dr. A. G. Tullar, who has practiced at Kennewick for many years, has disposed of his practice on account of ill health. He has left for Los Angeles where he intends to reside.

Dr. W. C. Crompton has disposed of his practice in Sedro-Woolley and has returned to Yakima, where he formerly practiced during the years 1903-1912. He has taken over the office and practice of the late Dr. John Nywening.

Dr. Julien Soule, of Kent, one of the pioneer physicians of the Northwest, has recently completed thirty-eight years of continuous practice in that city.

IDAHO

Boise Physicians' Club held its monthly meeting December 15. A symposium on acute abdominal pain was presented by several of the members. Election of officers for the ensuing year resulted as follows: President, Dr. H. W. Stone; vice-president, Dr. E. T. Biwer; secretary-treasurer, Dr. N. C. Trauba.

Dr. B. O. Clark, who for many years was engaged in practice at Emmett, has been appointed assistant surgeon in the hospital of the National Military Home, at Hampton, Va.

Dr. Russell Craft has disposed of his practice at Emmett and has gone to California where he will make his home.

Dr. E. W. Fox of Hailey has taken over the management of a hospital at Shoshone. He will continue to maintain his office at Hailey.

OBITUARIES

Dr. James Reed Yocom, Tacoma, Wash., died in a Seattle hospital Dec. 2, following a brief illness, aged 65 years. He was born at Swedenburg, Penn., in 1862, and graduated from Harvard University Medical School in 1888. He located at Tacoma soon afterward and practiced continuously there until the onset of his last illness. He was prominently identified with professional and civic organizations in that city. During the world war he occupied the position of provost marshall general, in which capacity he participated in the work of examining draft registrants.

Dr. Bert Thomas, pioneer physician of Walla Walla, Wash., died at his home following a three months' illness, aged 53 years. He was born in Walla Walla in 1874, and graduated from the University of Michigan Medical School, Ann Arbor, in 1904. He returned to Walla Walla soon afterward and engaged in practice there. He was instrumental in organizing the Walla Walla Valley General Hospital and was the first president of its staff.

Dr. William E. Welch, Rainier, Ore., died at the home of his sister in Portland Dec. 9, aged 66 years, following a long illness. He was born in Georgetown, Missouri, in 1861 and was brought to Oregon by his parents while still an infant. He was a graduate of Rush Medical College in the class of 1886. After practicing sixteen years in Pittsburg, Kansas, where he was chief surgeon for several railroads, he moved to Rainier, Ore., where he practiced until he was forced by illness to retire. He served during the years 1911-1912 in the office of mayor of Rainier.

Dr. Francis B. West, Bellingham, Wash., died suddenly at his home December 16, aged 85 years. He was born in Virginia in 1842, and graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1872. He located in Whatcom county soon afterward and later took part in the Klondike rush. In 1898 he located at Mt. Vernon and practiced there until his retirement ten years ago. He served terms as health officer of Mt. Vernon and also of Skagit county.

REPORTS OF SOCIETY MEETINGS

OREGON

COOS-CURRY COUNTIES MEDICAL SOCIETY

Pres., D. O. Osborn; Secy., P. M. Drake

Coos-Curry Counties Medical Society met at North Bend Dec. 6.

Dr. H. M. Shaw of North Bend read a paper entitled "Evolution."

The following officers were elected for the ensuing year: President, Dr. P. M. Drake, Coquille; vice-president, Dr. R. J. Dixon, Marshfield; secretary-treasurer, Dr. J. M. Simpkin, Marshfield; counsellors, Drs. Everett Mingus, Marshfield; Russel Keizer, North Bend; and A. B. Peacock, Marshfield.

JACKSON COUNTY MEDICAL SOCIETY

Pres., N. H. Heckman; Secy., E. W. Shockley

Jackson County Medical Society met Dec. 7 at the home of Dr. L. D. Inskeep in Medford.

Dr. R. J. Conroy, Medford, spoke on a surgical subject and Dr. Brunk made a few remarks concerning the dental survey which he is conducting in Jackson county.

The election of officers for 1928 resulted in the following selections: President, Dr. W. P. Holt, Medford; vice-president, Dr. Mattie Shaw, Ashland; secretary, Dr. Shipley, Medford; delegate to state convention, Dr. William Heckman, Central Point.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., C. B. Wight; Secy., R. H. Wellington

A joint meeting of Portland City and County Medical Society and Portland Academy of Medicine was held in Portland, Ore., Dec. 7, 1927.

Dr. T. Wingate Todd, professor of anatomy at Western Reserve University, delivered an address on "The Bowels of the Profession." It was illustrated by a large series of roentgenograms of the stomach and intestines, taken at short intervals of time, accompanied by movements of these organs.

The following officers were elected for the ensuing year: President, Dr. C. J. McCusker; vice-president, Dr. K. Martzloff; secretary, Dr. E. W. St. Pierre; treasurer, Dr. K. P. Gray.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., A. T. Wanamaker; Secy., W. W. Bell

A General Meeting of King County Medical Society was held at the auditorium of the Medical-Dental Building, Seattle, December 5, with President A. T. Wanamaker in the chair. One hundred and twelve members and visitors were present. Minutes of the last general meeting were read.

Applications for membership were read from Drs. D. D. Corlett, S. H. Ferguson, A. H. Grauman, C. L. Morrow, E. W. Rawson and J. W. Unis.

Dr. Reedy reported a case of pyloric stenosis, first seen in 1924, with ulcer of duodenum shown at autopsy.

Dr. Castlen presented a case of carcinoma of the mediastinal glands and one of miliary carcinomatosis.

President Wanamaker mentioned an article in the Seattle Times of December 4, asking for contributions for needy families, which condition was attributed to hospital and physicians' fees. The matter was referred to the Press and Public Information Committee.

Dr. E. T. Hanley, Commissioner of Health, presented a paper on "Social Service Work of the Health Department." He discussed the question of treating patients not entitled to tax-supported care. A report was made of patients admitted to the City Clinics from May first to November first, numbering 1979. These were segregated according to those treated in the clinics and those referred to other agencies for treatment. As far as possible patients are distributed to physicians and dentists according to their ability to pay for services, in order to relieve an unjust burden from the tax-supporters so far as is possible.

Dr. A. C. Feaman, Chief of Tuberculosis Section of U. S. Veterans' Bureau, presented a paper on "Some Phases of Pathology in Pulmonary Tuberculosis and Treatment by Rest and Other Methods." He reviewed facts concerning the problems of tuberculosis, the areas of the lungs most affected and described predisposing conditions. Various factors in successful treatment were discussed, including climate, nourishment and rest both of the lung itself and the patient. Education and self-care are vitally necessary. Most cases are not cured when discharged but are in quiescent stages, a majority of whom can continue to permanent cure. The paper was discussed by Drs. Slyfield and H. J. Davidson.

Dr. Charles R. Castlen read a paper on "Tumors of the Lungs." (See page 27.)

Nominations were made for officers for the ensuing year.

The Medical Section of the Society held a meeting December 12.

Dr. J. M. Bowers read a paper on "Arterial Hypertension," with an analysis of four hundred and sixty-one cases. Formerly increased blood pressure was supposed due to resistance of renal blood vessels, while at present it is attributed to a constriction throughout the vascular system. Starling demonstrated that a reduction of the amount of blood going through the vasometer center in the medulla produced a compensatory hypertension. Bradley and Baker found invariably an arteriosclerosis in the arterioles of the medulla in cases of hypertension, and not those with normal pressure. Fishberg in seventy-two autopsies on patients who had had essential hypertension, always found sclerosis in the terminal arterioles. O'Hare and Walker usually found thickened retinal vessels in cases of essential hypertension. Paland von Monakow reports cases in which no lesions of consequence were found in the arterioles, some cases showing no more extensive lesions than were found in individuals of the same age who had normal blood pressure.

Dr. John E. Nelson discussed the "Differential Diagnosis of Early Tuberculosis from Thyrotoxicosis." The problem is difficult in early cases, since there are no symptoms, signs or tests for definite differentiation. Symptoms peculiar to each were cited and compared with each other. The most important physical findings in tuberculosis are fine rales following cough, elevation of temperature, tubercle bacilli in sputum and low pulse pressure, contrasted in thyrotoxicosis with high pulse pressure, fine tremor and tumultous action of the heart. The paper was discussed by Dr. B. T. King.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. C. Wheeler; Secy., W. B. Penney.

The regular meeting of the Pierce County Medical Society was held on the second floor of the Washington Building, Tacoma, December 13, 1927, Dr. E. C. Wheeler in the chair.

PROGRAM

Surgical Management of Gastric and Duodenal Ulcer, Dr. George E. Pfeiffer.

Diagnosis of Right Upper Quadrant Pathology, Dr. H. J. Whitacre.

These two papers created a great deal of discussion, which was participated in by a large number of the members present.

Dr. George A. Delaney was elected a member of the society.

There being no further business, the meeting adjourned.

THURSTON-MASON COUNTY SOCIETY

Pres., H. W. Partlow; Secy., W. E. Steele.

Thurston-Mason County Medical Society held a meeting at Olympia Nov. 25.

Dr. William Rice of Shelton read a paper on "Medical Service."

Officers of the society for 1928 were elected as follows: President, Dr. J. F. Gibson, Olympia; vice-president, Dr. N. E. Roberts, Olympia.

Drs. Conger of Tono, and H. D. Lillibridge of Yelm were elected to membership.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., H. V. Wurdeman; Secty., M. J. Morris

The Puget Sound Academy of Ophthalmology and Oto-Laryngology met December 20 at 8 p.m. at the Virginia Mason Hospital, Seattle, the President, Dr. H. V. Wurdeman, presiding. Twenty members and four viistors were present. Clinical cases and case reports were presented.

Dr. Fleischauer presented a case of actinomycosis of the tongue of two months duration. It presented a firm, indurated mass on the side of the tongue involving its base. The infection had just reached the stage that a discharge was beginning to appear. No source of infection could be traced. This case was discussed by Drs. McCoy and Clark.

Dr. L. L. McCoy presented a case of a boy with bilateral persistent pupillary membrane.

Dr. Francis Brugman showed a man whose eye was injured by a blunt blow on the eyeball causing a rupture of the iris. This was followed by an increase of tension in each eye. He considered the case one of potential glaucoma in which an attack was brought on by the injury.

This case was discussed by Dr. W. O. Bell, who considered it a suitable case for iridectomy for reducing the tension. Dr. Davies considered it advisable to search for focal infection as the causative factor in the reaction following his injury. Dr. McCoy quoted Orcutt of Chicago, who advises atropine instead of eserin in cases of increased tension in cyclitis cases. Dr. Shannon considered the case one of hypertension and advised use of cocaine and homatropine. Dr. Hoffman discussed the nonoperative treatment of acute hypertension in which he had obtained good results by use of heat. Dr. Wurdeman considered the case one of hypertension due to subacute cyclitis and that since the fields and nerve were normal continuation of myotics was indicated rather than operation. Dr. Brugman in closing said that the man had had teeth extracted for infection and had refused operation upon the eye.

Dr. W. O. Bell presented a case of ectasis of cornea. The baby had staphyloma and ectasia of the cornea following gonorrheal conjunctivitis and is blind in spite of all treatment of the conjunctivitis. Dr. Goss in discussion spoke of the unusual membranous conjunctivitis with very little purulent discharge. Thinning of the cornea at the limbus caused the ectasia of the cornea.

Dr. Schoffman presented a case of sclerosing keratitis in a ten year old girl. Although no infection was found in her chest on account of her tuberculous family history, she was placed on tuberculin therapy. Her eyes have greatly improved under this treatment as has her general condition. This case was discussed by Dr. Wurdeman who said that local improvement or cure follows rapidly in some cases but that much general treatment and time is necessary to secure a systemic cure. Dr. Hoffman said he did not feel that these cases yield to tuberculin therapy as rapidly as some other tuberculous eye conditions. He also contrasted sclerosing keratitis with sclerosis of the cornea which extends over the cornea from the periphery.

Dr. H. L. Goss showed a man 59 years old who had thrombosis of the central vessels of the retina. The case was approaching the end stage. This case was discussed by Drs. Hoffman and McCoy.

Dr. Walter Hoffman presented a case of rupture of the eyeball with dislocation of the lens under the conjunctiva. This man was struck in the eye by a piece of wood a week previously. The lens could plainly be seen lying under the conjunctiva above the upper limbus. The iris was badly torn and the pupil contained some debris of the capsule. He expects to slit the conjunctiva and deliver the lens.

Dr. M. J. Morris presented a case of congenital microphthalmia in a girl 22 years of age. Dr. Clark considered it advisable to enucleate the small eye before attempting to wear a prothesis, because of the danger of sympathetic ophthalmia. Dr. Wurdeman called attention to the fact that some cases of sympathetic ophthalmia had been reported from such procedures, the cause of which was the entrance of pathogenic germs into the uveal tract probably from erosion or wound from the artificial eye.

Dr. Morris also reported a case of tumor of the cerebellopontile angle. This case had sought relief for several years from violent tinnitus. She had had the ethmoid cells exenterated, tonsillectomy and much ear treatment. There was complete nerve deafness on the right side, accompanied by symptoms and signs of increased intracranial pressure with optic atrophy secondary to choked disc.

The applications of Dr. S. M. Samuels, Seattle, and Dr. W. H. Ludwig, Tacoma, were read.

IDAHO

SOUTH SIDE MEDICAL SOCIETY

Pres., E. L. Simonton; Secty., W. F. Passer

A special meeting of South Side Medical Society was held Monday, Dec. 19, 1927, at Park Hotel, Twin Falls, Ida. There was an attendance of twenty-eight members and guests.

Dinner was served at 6:30, the meeting following.

The special guests of the evening were Drs. Blair Holcomb and Guy L. Boyden of the Jones Clinic, Portland, Ore.

The program consisted of papers on the following subjects.

"Diabetes in Children (Moving Pictures). Blair Holcomb, M.D.

"Sinus and Ear Infections as Cause of Systemic Disease in Infants and Children." Guy L. Boyden, M.D.

These papers were greatly enjoyed by all and this was universally pronounced one of the best meetings in the history of the society.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Medical Science. Its Theory and Practice. Edited by Sir William Osler Bart, M.D., F.R.S. Third Edition, Thoroughly Revised. Reedited by Thomas McCrae, M.D., Professor of Medicine in Jefferson Medical College, Philadelphia, etc. Assisted by Elmer H. Funk, M.D., Assistant Professor of Medicine in Jefferson Medical College. Vol. V. Diseases of the Blood, Diseases of the Lymphatic Glands, Diseases of the Ductless Glands, Diseases of the Urinary System, Vasomotor and Trophic Disorders, and Diseases of the Locomotor System. Illustrated. Cloth, 948 pp. $10.00. Lea and Febiger, Philadelphia, 1927.

This volume begins with an unusually excellent description of pathology of the blood-forming organs and blood diseases by Richard C. Cabot, than whom none is higher authority on the subject nor a more interesting teacher in the domain of internal medicine. His article on pernicious anemia may be said to be the last word on the subject to date. He brings out many interesting points. The theory of intestinal stasis, elaborated by Faber of Copenhagen in a little book recently reviewed in these columns as the result of much experimental work, Cabot does not believe in, although Faber has produced pernicious anemia in animals by causing stasis in the small intestine through partial obstruction of the bowels. According to Cabot some poison is produced somewhere in the body that gives rise to the achylia, gastrointestinal symptoms, sore mouth, spinal cord changes and anemia characteristic of the pernicious disease. The achylia is noth the result of atrophy of the gastric mucous membrane in many instances and pernicious anemia may probably be regarded as not primarily a disease of the blood because many organs are affected often a long time before the blood, as in the case of the nervous system. This article is based on a careful analysis of some 1200 cases. The disease is twice as common in men as in women, and rarely is seen before the age of thirty-five. Also one or two remissions are the rule, occasionally lasting as long as twelve years. Cabot doubts the diagnosis in a case of complete recovery from the disease, although it will be seen that it would be necessary to wait more than twelve years to be certain that apparent recovery was not in reality a remission.

He has practically never seen a case in which the blood picture, during the active phase of the disease, would not distinguish it from other forms of secondary anemia but admits that other authorities do not agree with him on this point. It has seemed to the reviewer that in most instances a diagnosis may be made more readily on the clinical symptoms than on the blood picture and in very many patients most pathologists are unwilling to make a diagnosis on the blood picture alone.

Gastrointestinal crises of pain occur in 60 per cent of cases and diarrhea in 50 per cent. This statement would indicate a severe pain, such as seen in the crises of tabes, but severe pain is certainly not characteristic of pernicious anemia. A considerably enlarged heart is found in 18 per cent of cases. In some patients the reviewer has seen a mistaken diagnosis, when the anemia was not very apparent but the heart symptoms prominent. Unusual pulsations of the carotids have been observed in 42 per cent of cases. This is due to thinning of the vessels seen at autopsy. In a recent case of goiter heart with secondary anemia a wrong diagnosis was made of pernicious anemia. Perhaps it is not generally recognized that low blood pressure is very characteristic of pernicious anemia; few diseases showing so low a systolic pressure (60-80). While sore mouth is seen in nearly 50 per cent of cases, yet it is chiefly subjective. The occurrence of actual lesions in the mouth Cabot thinks greatly exaggerated.

This whole volume has seemed to the reviewer to be one of the very best and contains so many extraordinarily good articles that to attempt to review them would be impossible, or even to enumerate them. Osler's Modern Medicine is assuredly a classic and indispensable for the general practitioner and internist. WINSLOW.

UROGRAPHY. By William F. Braasch, M.D., Head of Section of Urology, Mayo Clinic; Professor of Urology, Graduate School of Medicine, University of Minnesota. Second edition, revised and enlarged. Octavo of 480 pages. Illustrated with 759 roengenograms. Philadelphia and London: W. B. Saunders Company, 1927. Cloth $13.00 net.

This revised and enlarged edition of Braasch's original work, "Pyelography," contains so many changes, additions and new material that it is for all practical purposes a new treatise. Because of the additional chapter on cystography and uretherography, the title "Urography" has been used to indicate a more comprehensive roentgenographic study of the urinary tract made opaque.

There are thirty pages on technic, including contraindications, media used, technical errors and roentgenographic technic, followed by forty pages on the normal renal pelvis and ureter. The importance of a thorough familiarity with the various types of normal pyelograms and ureterograms is emphasized. This chapter and the section on ureteral stricture are recommended for careful study. The diagnosis of ureteral stricture has become unduly popular in recent years. Familiarity with the normal anatomic points or narrowing and spindle-like dilatations in the ureter, with the various phases of ureteral peristalsis and with ureteral spasms following injection, would reduce the incidence of this diagnosis. In this connection it is refreshing to find that Braasch still maintains the position he has held from the beginning. Although he recognizes ureteral stricture as an entity, he demands certain criteria for a diagnosis, of which the most important is dilatation above the stricture. He emphasizes, "that unless the dilatation is well marked, it is of doubtful clinical significance. Dilatations as shown in illustrations in current literature are frequently so slight that a diagnosis is scarcely warranted."

The various anomalies and diseases are considered in detail and the points illustrated by 793 excellent reproductions of original roentgenograms.

The chapter on cystography is a valuable addition. The changes produced by prostatic obstruction, neoplasm, diverticula, inflammation, extravesical pressure, cord bladder and regurgitation and reflux are amply demonstrated by cystograms. Although this volume is intended primarily for the specialist, it is extremely valuable to anyone interested in modern methods of diagnosis. HEPLER.

GALVANIC CURRENTS AND LOW VOLTAGE WAVE CURRENTS IN PHYSICAL THERAPY. By G. Betton Massey, M.D., Fellow and Former President American Electrotherapeutic Association, etc., and Frederick H. Morse, M.D., Fellow and Former President American Electrotherapeutic Association, etc. 190 pp. The Falcon Press, Boston, 1927.

There are many useful applications of the galvanic current in the treatment of diseases, with which few physicians are familiar. This volume offers definite information on this subject, with a review of the diseased conditions to which it is applicable, giving a clear description of therapeutic technic. Results from use of the galvanic current depend primarily upon the individual characteristics at the positive and negative poles, which are thoroughly discussed herein. Uses of ionization are described, by which binary compounds are separated by the current and each utilized for specific medication. The use of the current in various diseases is discussed with details for its use in each.

Part II discusses the low voltage, alternating current, in which the sine wave is described with the technic of treatment. The authors believe that many conditions of faulty intestinal states can be helped by this current, in connection with other rational methods of treatment. This work is to be commended to every physician interested in electrotherapeutics. He cannot become an expert in this line of therapy unless he is familiar with modern applications of the galvanic current.

NUTRITION AND DIET IN HEALTH AND DISEASE. By James S. McLester, M.D., Professor of Medicine, Graduate School of Medicine, University of Alabama, Birmingham, Ala. Octave of 783 pages. Philadeplhia and London. W. B. Saunders Company. 1927. Cloth, $8.00 net.

This book is the product of a very mature, intensive and practical mind. The abundance of literature reviewed in its preparation gives a wealth of information which will lighten the burdens of everyone working in this intensely interesting and practical field. The subject matter covers the physiology of metabolic processes as known. Dietetic principles of practical, fundamental importance are presented, and a good classification of diseases amenable to dietetic management is given.

Under the discussion of the various disease headings, such as diabetes, diseases of the digestive organs, and diseases of the kidney and urinary organs, will be found a good, general discussion of the physiology and the pathology involved. This is followed

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by a careful explanation of methods of treatment, and the chapter closes with a splendid bibliography. The physician in general practice who wishes to bring himself up to date in the matter of the use of dietetic principles in his practice will find wonderful aid here.

HOFRICHTER.

THE OPHTHALMIC YEAR BOOK. Vol. XXIII. Containing Bibliographies, Digests and Indexes of the Literature of Ophthalmology for the year 1926. Edited by William H. Crisp, With 31 Collaborators. 338 pp. Ophthalmic Publishing Co., Chicago, 1927.

It is to be regretted that this valuable reference publication could not receive sufficient support to meet the rather heavy expense of publication. This review of the literature of ophthalmology was begun by Edward Jackson in 1903 and has continued with intermissions of 1918-1923 in the form of an annual volume. During those years it was published under the name of Ophthalmic Literature in quarterly parts. The present volume covers the literature of 1926 and a portion of 1925, giving a digest of principal articles under thirty-two appropriate headings. The work has been invaluable for research and especially for writers on opthalmic subjects. It is possible that the suspension of the Year Book may stimulate the independent development of another enterprise to fill the same field and to collate the literature of opthalmology in abstract form for English-speaking readers.

WURDEMAN.

MINOR SURGERY. By Arthur E. Hertzler, M.D., F.A.C.S., Chief Surgeon, Halstead Hospital, and Victor E. Chesky, A.B., M.D., F.A.C.S., Chief Resident Surgeon, Halstead Hospital. With 438 Illustrations. 568 pp. $10.00. The C. V. Mosby Co., St. Louis, 1927.

This volume abounds with practical suggestions and well described methods of treatment which make it one of the greatest value. The authors state that it has been prepared with the idea of helping the dispensary student in the out-patient clinic and that only things of proven worth are included within its pages. The illustrations are numerous and appropriate and almost equal the pages of the book in number. The unique style of the senior author is impressive in a work of this kind.

FORBES.

PRINCIPLES OF CHEMISTRY. An introductory Textbook of Inorganic, Organic and Physiological Chemistry for Nurses and Students of Home Economics and Applied Chemistry, with Laboratory Experiments. By Joseph H. Roe, Ph.D., Professor of Chemistry, George Washington University Medical School, etc. Illustrated. 378 pp. $2.50. The C. V. Mosby Company, St. Louis, 1927.

This volume is written in simple and popular language comprehensible by those for whom it is intended. Theoretical principles have been discussed in detail but complicated chemistry has been omitted. Sufficient organic chemistry is included to give a general idea of carbon compounds, with sufficient physiological chemistry for the discussion of digestion, metabolism and similar problems. Chapters are devoted to hydrogen, oxygen, nitrogen, carbon, the atmosphere and similar subjects. Part II includes laboratory experiments presented as simply as possible but with sufficient elaboration to obtain impressive results.

AN INTRODUCTORY COURSE IN OPHTHALMIC OPTICS. By Alfred Cowan, M.D., Assistant Professor of Ophthalmology in the Graduate School of Medicine, University of Pa., With 121 Illustrations, many in colors. 262 pp. $3.50. F. A. Davis Co., Philadelphia, 1927.

This is a small octavo, the outgrowth of notes used by the author in his lecture and laboratory course. It conveys a working knowledge of opthalmic optics in the language of the average student of ophthalmology. It is reasonably thorough and is constructed so that a student having only an elementary knowledge of mathematics can follow the subject with ease. The work deals with the principles of refraction, lenses, the dioptric system of the eye and its anomalies of myopia, hyperopia, astigmatism and accommodation and then takes up the subject of ophthalmoscopy and retinoscopy. As a textbook and a work of reference it is recommended.

WURDEMAN.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 7, Number 5 (Pacific Coast Surgical Association Number—October, 1927.) 266 pp. With 132 Illustrations. Per Clinic Year (February, 1927, to December, 1927.) Paper, $12.00; Cloth, $16.00 net. Philadelphia and London. W. B. Saunders Company.

This volume is of particular interest for readers of this journal because the clinical reports are presented by surgeons from the Pacific Coast, with liberal representation from Oregon and Washington. Articles appear from Coffey, Dillehunt and Holden, of Portland; Lamson, Swift, Mason, Dwyer and L. J. Palmer, of Seattle; Matthews, of Spokane; McNerthney of Tacoma, and Caldbick of Everett. While most of these writers content themselves with one or two reports, Matthews is particularly well represented with reports of seven cases. These papers cover a wide range of subjects of interest to everyone with surgical inclinations. Since this year is the centennial of the birth of Joseph Lister, the founder of modern surgery, this volume is dedicated to him as a tribute to his memory.

A TEXT-BOOK OF CLINICAL NEUROLOGY. By Israel S. Wechsler, M.D., Assistant Professor of Clinical Neurology, Columbia University, New York, Attending Neurologist, The Montefiore Hospital, New York. Illustrated. 725 pages. W. B. Saunders Company, Philadelphia and London. 1927.

This is a very well arranged book. Special chapters on symptoms and signs are clearly set forth. The different diseases of the cord and the brain are well arranged, and briefly outlined. The paper is good, the illustrations numerous and in general it is a book that the student, the general practitioner, or the man specializing in nervous and mental disease can read with a great deal of comfort. It should be in the library of the general medical profession.

NICHOLSON.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

THE THYROID GLAND AND ITS RELATION TO DISEASE *

David Marine, M.D.
NEW YORK CITY

There is no field of medicine where greater confusion and more nonsense exist than in connection with the real and fancied relations of the thyroid to various clinical syndromes on the one hand, and the relation of these several clinical syndromes to structural alterations in the thyroid on the other hand. The truth of this statement is clearly demonstrated in the numerous classifications both clinical and anatomic that have arisen, particularly involving Graves' disease.

Regarding the relation of the thyroid to clinical disease there are many reasons and some justification for the formidable array of clinical terms now in use. The most important ones, however, depend on the highly variable symptomatology and on the fact that we know almost nothing regarding the nature of Graves' disease.

Regarding the relation of structural alterations in the thyroid to clinical manifestations there is no justification for the present confusion. This is due largely to the attempts to correlate clinical diseases believed to be due to the thyroid with structural alterations in the gland. This is quite impossible. Virchow pointed this out more than sixty years ago in the following words: "With reference to true goiter the opinion has long been held that it comprises a series of definite varieties (struma hyperplastica, colloides, cystica, ossea, vasculosa, hemorrhagica, nodosa, Basedowii, etc.) which can develop independently of each other. This is wrong. All these so-called varieties are only different modes of development of essentially the same form of goiter . . . . and a large and striking variety of these metamorphoses may exist in the same goiter." Theodor Kocher in 1902 pointed this out in connection with Graves' disease and my own studies are in entire agreement with these observers. We believe that the thyroid has but one cycle of morphologic changes. This cycle occurs in all animals with the ductless thyroid and has no necessary relation to the various clinical associations.

As regards the clinical classifications of thyroid diseases even greater confusion exists. In addition to the purely clinical terms, like simple, endemic, sporadic, physiologic, nodular, adolescent, toxic, hyperthyroidism, thyreotoxicosis, toxic adenoma, dysthyroidism and a host of others, we have still another group of terms (truly a grotesque admixture of clinical and anatomic conceptions), as for example toxic nonhyperplastic, toxic hyperplastic, nontoxic hyperplastic, nonhyperplastic nontoxic, etc. These particular terms were introduced by workers at the Mayo Clinic in order to evade designating any case as Graves' disease, in which the thyroid was not actively hyperplastic. They vigorously supported this view for several years which is sum-

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

marized in their often quoted published statement that, given the condition of the thyroid, one could predict the symptomatology and vice versa. Such a position was, of course, untenable.

If we disregard all the fictitious and artificial classifications that have been proposed and base our conception of the relation of the thyroid to disease on what is definitely known regarding the physiology, the chemistry and pathology of this gland, we would at least be on firm ground, although I am sorry to say our present knowledge falls far short of any definite understanding of the subject.

Basing our conception of thyroid diseases, therefore, on the physiology, chemistry and pathology of the gland we have come to the following classification:

- I. Thyroid insufficiencies
  - (a) Simple goiter (endemic, sporadic).
  - (b) Myxedema.
    - (1) Infantile (cretinism).
    - (2) Adult (Gull's disease).
- II. Graves' disease.

In my opinion Graves' disease does not properly belong with the true thyroid diseases but, since the thyroid is an important factor in it and we lack the knowledge necessary for a more accurate classification, it is best to leave it here for the present.

Brief reference may be made to certain of the clinical features of thyroid diseases. With reference to the thyroid insufficiencies, the literature of the last ten years indicates that there are now no great differences of opinion regarding the essential features of simple or endemic goiter and myxedema, although quite within the memory of many of us the same confusion existed as exists today in relation to Grave's disease. Everyone, I think, agrees that simple goiter is a work hypertrophy of the thyroid and is dependent immediately upon an absolute or a relative insufficiency of iodine. This, of course, leaves open the question of the remote, predisposing and possibly fundamental cause of the disease. It is now known that the thyriod will enlarge, when the intake of iodine is below the normal body needs or when the body needs for one reason or another are so increased that the normal intake is for the time being insufficient. The former condition is seen more particularly in the great goiter districts of the world. The latter is seen in the so-called sporadic goiter, occurring in association with various infectious diseases, pregnancy, abnormal diets and certain derangements of internal secretion (status lymphaticus, Addison's disease, acromegaly, chlorosis).

Further, there is a general agreement both among internists and surgeons regarding the means of prevention and the limitations of treatment. No one would claim, however, that we are near a final understanding of this subject and I have referred to simple goiter and myxedema mainly to emphasize how a few facts, if they are crucial ones, can destroy concepts based on ignorance.

In contrast with simple goiter we know practically nothing regarding the fundamental disturbance underlying Graves' disease. It occurs spontaneously only in man and this deprives us of one important means of approach which so materially aided us in simple goiter. Up to the present time it has not been completely reproduced in animals, although there are suggestive studies in this direction.

There are two prevailing theories: (1) That the disease is of thyroid origin and (2) that the disease primarily depends upon a constitutional anomaly or defect which renders the individual's autonomic nervous control over various visceral functions susceptible of injury by a great variety of nonspecific influences, such as fright, worry, overwork, the undermining of nutrition by infectious disease, etc. This constitutional defect may be congenital or acquired and appears to be closely related to that present in status lymphaticus, Addison's disease and chlorosis. Experimentally a symptom-complex related to Graves' disease can be produced in rabbits and cats by sufficient but sublethal injury of the suprarenal glands.

In rabbits we have been able to obtain a definite increase in the metabolic rate, beginning from three to six days after suprarenalectomy and lasting from a week to several months, provided the thyroid gland is intact. This effect we have attributed to insufficiency of the cortex. During this reaction there is thymus regeneration which is also characteristic of Graves' disease. Such animals are hypersusceptible to a great variety of physical and chemical agents, just as in the case of Graves' disease. The well known Goetsch test is an example of this hypersusceptibility and, while I do not believe that such a test is specific for or diagnostic of Graves' disease, it is highly probable that individuals manifesting hypersusceptibility to adrenalin have the constitutional anomaly or defect which underlies the development of Graves' disease.

Finally, I believe it is necessary to discard the view which seems to have gained wide acceptance in recent years, namely, that Graves' disease may be split up into several clinical entities, as for example, "exophthalmic goiter," "adenomatous goiter with hyperthyroidism" and "toxic adenoma." The protean symptomatology of Graves' disease has been emphasized for more than fifty years, and from what we now know of the disease it seems more rational to assume that the variations in symptomatology are dependent upon the variations in the activity of the visceral nervous system, with the thyroid function remaining qualitatively unchanged, than to assume that all these clinical variations are dependent upon either qualitative or quantitative changes in the thyroid gland.

Since there is no morphologic basis in the thyroid for thus splitting up Graves' disease, certain observers, particularly Plummer, have attempted to separate toxic adenoma from Graves' disease by means of the iodine reaction. His hypothesis assumes that iodine causes a drop in the metabolic rate in exophthalmic goiter because iodine completes an incomplete thyroxine, whereas iodine according to him does not lower the metabolic rate in case of so-called toxic adenoma. This hypothesis does not include all the facts. In the first instance a great many cases of Graves' disease with adenoma react with iodine with a temporary fall in metabolism, and in the second instance not all cases of Graves' disease without adenoma show a temporary fall in metabolism with iodine.

The phenomenon may have a simpler explanation than that advanced by Plummer, in that the fall in metabolism might be dependent upon the well known involuting effect of iodine on hyperplasia. Iodine administration causes a rapid storage both of iodine and colloid in the follicles and a rapid involution of the hyperplasia. The stretching and distention of the follicles with colloid causes partial occlusion of the perifollicular capillaries and lymphatics and a *pressure retention* which temporarily blocks excretion until the thyroid cells have accommodated themselves to the increased pressure and until the vascular capacity of the perifollicular capillaries is restored.

In support of this view are the following facts: (1) Iodine administration does not lower the increased metabolism caused by feeding desiccated thyroid or thyroxine, (2) iodine does not materially change the metabolic rate in individuals with fully involuted thyroids, (3) iodine when given in small doses does not cause a rapid storage of colloid or a rapid fall in heat production, (4) the fall in heat production corresponds in time and probably in degree with the morphologic manifestations of involution of the hyperplasia, (5) desiccated thyroid does not cause a rapid fall in metabolism even in cases with hyperplastic glands, (6) cases with adenomatous hyperplasia which do not react to iodine with storage and involution do not show a lowering in metabolism. The same temporary drop in metabolism can be produced in animals, provided the gland is hyperplastic and large doses of iodine are used, and Martin has recently shown that a drop in heat production can also occur in simple goiter in man.

The explanation, therefore, of the temporary drop in heat production seems to be dependent upon the long-known fact that the sudden administration of large amounts of iodine causes a rapid storage of colloid with distention of the follicles. This follicular distention in turn produces a pressure retention or inhibition of the secretory activity. After about two weeks in cases of Graves' disease, however, the cells accustom themselves to this physical and chemical alteration and the metabolism rises again. The phenomenon erroneously known as "iodine thyroiditis" is an excellent clinical illustration of the effect of the sudden administration of large amounts of iodine to individuals with hyperplastic glands. The dangers that accompany the uncontrolled use of iodine in individuals with the anlage of Graves' disease are serious and much harm has already resulted. It is, therefore, only proper that I should briefly outline my views on the use of iodine in the treatment and prevention of goiter and in Graves' disease.

In the first place, we must distinguish clearly between the use of iodine in the *prevention* and its use in the *treatment* of goiter. In the second place, we must further distinguish between *simple goiter* and *Graves' disease.*

1. *Iodine in the prevention of goiter.* The principle of prevention depends upon the fact that, if the iodine store in the thyroid is constantly maintained above 0.1 per cent (by the methods we have used) of iodine per gram of dried gland, or about 5 mg. for the entire normal human thyroid, no hypertrophic or hyperplastic changes occur. The maximum store of iodine in the normal gland is between 20 and 30 mg. The application of methods of prevention in man are fundamentally more difficult than in animals because of the occurrence of Graves' disease. While it is possible to control thyroid enlargement with safety in children up to the age of puberty and in animals of all ages using a wide range of doses, it becomes increasingly dangerous in man after puberty to use large quantities of iodine.

The important question is, therefore, "What is the minimum amount of iodine necessary for prevention in man." This has not yet been determined.

The available data would indicate that 40 to 50 mg. of iodine yearly would be ample, if this could be distributed uniformly throughout the period. Many plans have been proposed but no satisfactory plan is yet available. Where universal prophylaxis is necessary, it seems to me that iodized salt is the plan of choice. Undoubtedly the percentage of iodine in American iodized salts has been too high and 1 mg. per 100 gms. of salt, that is, 0.001 of 1 per cent or one part in a hundred thousand, would be more in agreement with our present knowledge of thyroid function. Where special groups are to be protected, as for example school children, the Swiss plan of giving 1 mg. a week throughout the year would suffice.

2. *Iodine in the treatment of goiter.* The greatest value of iodine in thyroid disease will, I believe, always be in prevention. Its value in the treatment is limited, since no plan of iodine therapy can with certainty accomplish more than relief of any existing physiologic insufficiency. This it certainly does, but whether a curative effect is produced or not, and certainly if the individual expects to seek surgical intervention in the event of failure of medical treatment, iodine should be given.

The best plan of medical treatment in my opinion requires, first, the administration of standard U.S.P. desiccated thyroid in 0.1, and certainly not greater than 0.2 gram doses daily for a period of two weeks, and if after examination there has been no change in pulse rate, body weight or other evidences of thyroid activity, the treatment should be repeated. After an interval of from one to two weeks, iodine to the amount of 10 mg. daily may be given for a period of two or three weeks. Syrup of hydriodic acid or syrup of ferrous iodide provides this amount, when administered in 1 c.c. doses daily. This combined treatment with desiccated thyroid and small doses of iodine may be repeated three times during the year, and for the maximum reduction at least a year is required.

3. *Iodine in the treatment of Graves' disease.* Patients with Graves' disease are hypersensitive to iodine as they are to most drugs. The beneficial effects of iodine are limited, while its injurious effects are serious. Until the cause of the thyroid stimulation, which everyone is agreed exists in Graves' disease, can be relieved, no lasting benefit will occur merely from supplying the element from which the thyroid can manufacture and excrete more thyroxine more easily and more quickly.

The injurious effects of iodine were known to Coindet in 1821 and, judging from the experience of the last three years, we have not profited greatly by the work of a century. During these three years we have witnessed a remarkable increase in the injurious effects of iodine in this country, but fortunately there has been but little or no increase in other countries. In this country the increase occurred at the time when the use of iodized salt was also increasing and some observers have drawn the conclusion that it was largely due to the use of iodized salt.

I would not deny that the amounts of iodine in iodized salt have aggravated cases of Graves' disease. I have never seen it. These observers, however, overlooked the important fact that the alarming increase in the serious effects of iodine have occurred only within the last three years and coincide with the widespread use of heroic doses of iodine, especially in the form of tinctures and Lugol's solution.

What the Mayo Clinic observers did was to take advantage of the well known effects of iodine in making the operation of thyroidectomy safer. For this purpose they used mammoth doses of iodine only in cases to be operated upon within ten days. If the use of such doses could have been limited, as Plummer advised, to those individuals to be operated upon within two weeks, doubtless much good would have resulted. Unfortunately the use of iodine could not be thus controlled and large amounts have been given over periods of weeks and months during the past three years to all classes of goiter, both by the profession and by the public at large, with the result that an alarming increase in "iodine Basedows" has occurred, which bids fair to temporarily discredit in this country the proven use of iodine in goiter prevention.

THE GOITER PROBLEM *

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The development of the goiter problem has come practically entirely within my purview in the last thirty years. I remember seeing pathologic specimens in the London Hospital thirty years ago, where the thyroid gland formed practically a ring around the trachea, and I thought how formidable a task it would be to attempt to remove such a growth. The thyroid at that time was one terra incognita to the surgeon, and the best surgeons were strongly of the opinion that its removal was not justifiable. So completely is that condition changed that in careful hands at the present time we reckon thyroidectomy among the safe operations.

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* Read before Idaho Falls County Medical Society, Idaho Falls, Ida., Dec. 2, 1927.

A few words about the anatomy. The circulation is carried on by the superior and inferior thyroid arteries. The vascularity of thyroid tissue is greater than that of any other tissue in the body, hence these arteries of supply are of large size. The beginning surgeon encounters no difficulty in the superior artery, which is a branch of the external carotid and enters the upper pole of the gland. The inferior vessel is a branch of the thyroid axis. It does not come to the lower pole of the gland but swings around behind the carotid sheath and goes in a transverse direction to the back surface of the gland but a little below the middle. Here it divides into two main branches, one of which shoots directly forward through the substance of the gland and the other continues in a transverse direction to the space between the gland and the trachea. The recurrent laryngeal nerve comes close to this inner branch of the inferior thyroid artery and may be injured in picking up this branch. The largest veins come directly downward from the inferior border. There are lateral veins which come outward to the jugular, and small veins which go up through the upper pole.

The simplest classification of goiter is into colloid, adenomatous and exophthalmic. We may otherwise divide goiters into simple and toxic. Adenomatous goiter is very common in goiter districts. The adenomata may be of various sizes and the larger tend to break down in the center, forming cystic goiter. As the patient approaches forty a good percentage of adenomata will become toxic. Since the operation for these in careful hands is very safe, I come to think that they are mostly surgical in their aspect and should be removed.

The colloid goiter for the most part will be cured by proper medical treatment. There can be no longer any question about the advisability of treating toxic goiters surgically. There are two types of toxic goiters, the adenomatous and the hyperplastic. The hyperplastic develops earlier by about ten years on the average. Its symptomatology tends to go in waves of about three months' duration. Most of the cases will improve to a considerable extent when they reach the apex of the wave. The chiropractor or the therapeutic enthusiast, who gets in his treatment on the down stroke after the crest of the wave is reached, imagines that he has cured the patient.

The use of lugol solution in preparing these patients for operation is universally accepted. I rarely ligate any of them any more. After a few days of rest and the use of lugol, most of these cases can be safely operated upon.

The toxic adenoma has more of a continuous symptomatology. There is not the tendency to go in waves. The patient has had an adenomatous goiter for many years, then notices a little increase in the frequency of the pulse, begins getting tired, nervous and cranky. Ordinarily these patients lose weight, although the appetite is not impaired but rather increased. These symptoms gradually increase until the patient gets down and unable to move. There is no question that they should be treated surgically at the earliest stage of the game possible. Not a few of them have induced the toxic phase of their disease by the use of iodine. The results of surgical treatment are exceedingly gratifying.

The technic of thyroidectomy is pretty well established in the minds of well trained surgeons. I use light gas anesthesia, supplemented by one-half per cent novocaine locally. In the smaller growths I split the muscles vertically, but in the larger growths I cut the muscles also transversely. While one does not make an unnecessarily large skin wound, in so technical an operation as this one should have room to work without difficulty. In the great majority of cases the scar will be inconsiderable, if due care is taken to match the skin together properly and to get it carefully approximated.

I omit drainage in the lesser cases, but employ it always in the larger. In exophthalmic goiter I remove all but a small amount of the gland on each side.

About one case out of twenty-five will take on hyperplastic growth again and some of these will need reoperating on. The use of iodine over a period of time after the operation may tend to prevent this recurrence, but I think it is unavoidable in a certain small percentage of cases.

In the adenomatous type I leave more gland. The only cases of myxedema I have had have been one or two who had suppuration in the wound, and I think infection is a thing we ought to take every pains to avoid.

I know of no more gratifying thing in the domain of medicine and surgery than the rapid and satisfactory return of these badly poisoned patients to health. They are certainly among the most grateful patients we ever have anything to do with.

Iodine treatment of goiter in young people yet in their 'teens is proper and often curative, but we have to continue the treatment over quite a long period of time. I believe the desiccated thyroid is much more effectual than the iodine salts. I never give iodine to a goiter patient who is over twenty-five years of age, unless it be lugol for a brief period of time to prepare the patient for operation.

McArison has shown that five per cent of children born of goiterous mothers will be cretin imbeciles, hence it is probably a good practice to give the expectant mother small doses of iodine throughout the full period of her pregnancy.

One point about the technic of operation has been very important in my hands. That is the use of large compression clamps of the Mesu type which will hold and compress the gland without tearing it. In the cases where there is great vascularity these clamps give one mastery of the situation very promptly. Before the patient is discharged, all sites of possible infection in tonsils, sinuses and the teeth should be looked into and foci of infection corrected if they are found.

THE LARYNX IN THYROID SURGERY*

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There still prevails considerable haziness and more than a few misconceptions in regard to the paralyses found in the larynx in diseases of the thyroid gland, and as the result of surgery in the thyroid region. It is my purpose to point out wherein the more recent observations have differed from the commonly accepted ideas on this subject.

The larynx receives its sensory and motor nerve supply through the superior and inferior branches of the vagus or tenth cranial nerve. The superior laryngeal nerve divides into an external branch which supplies the cricothyroid muscle and part of the arytenoideus. The internal branch supplies sensation to the larynx. The cricothyroid muscle tenses the vocal cord, and this and the arytenoideus muscles are the only muscles supplied by the superior branch. This branch is well out of the thyroid field and is rarely, if ever, injured. The inferior branch supplies all the other muscles of the larynx, including both adductors and abductors. In the early part of its course this nerve differs on the two sides. The right is given off at the root of the neck as the vagus crosses the anterior surface of the subclavian artery. The left comes off the vagus as it crosses the anterior surface of the arch of the aorta, and after passing below and in back of the arch passes upward to the neck. After entering the neck both nerves pass upward posterior to the carotid sheath, in the groove between the trachea and esophagus and posterior to the thyroid. It is usually anterior to the inferior thyroid artery, but may be posterior. Thus we see that the motion of the vocal cord is principally supplied by the inferior laryngeal nerve, whose function is often disturbed by disease of the thyroid gland and as a result of surgery in this region.

When the nerve supply to the larynx is injured, there is a resulting paralysis of the musculature of the vocal cord on the side involved. When this occurs the cord is said to be fixed. A paralyzed cord may be fixed in midline; that is, the position of phonation when the abductor muscles are affected, or in the lateral or the position of respiration when adductors are affected.

The cord may be found to be tense or relaxed in either of these positions. I believe that further classification into a midway or cadaveric position is confusing, as there is no way of knowing the normal excursion of any cord, due to the variation in different individuals, and due to the interference from swelling so often seen postoperatively. The abductor can be totally paralyzed and the adductor intact, but the cord is being held in the so-called cadaveric position by swelling around the cricoarytenoid joint.

There is an evident decrease in the number of cords found affected preoperatively. Ten years ago ten to twenty-five per cent were often reported. Now we find one to three per cent in series of three hundred to a thousand cases.

Fixation of a cord preoperatively, due to pressure of an enlarged thyroid, does occur but is rare. Every case showing this phenomenon that I have seen during the past three years, with the exception of one, has proven to be a malignancy. The one exception was an enormous adenoma, clinically, and I did not have an opportunity to follow up the pathology as the patient refused operation. The reports from competent pathologists that malignant thyroids are not always immobile and indurated as formerly thought make it still more imperative to rule out this condition where the cord is fixed preoperatively.

According to Crotti, Judd and others, bilaterally fixed cords preoperatively always means malignancy of the thyroid. When a fixed cord is found before operation and the thyroid proves not to be malignant, paralysis from other causes should always be ruled out. Among these the commonest are aneurysm, mediastinal growth and mitral stenosis.

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* Read before the Thirty-eighth Annual Meeting of Washington State Medical Association, Tacoma, Wash., Aug. 29-31, 1927.

Postoperatively in the majority of cases, if seen soon after operation, the cord is found fixed in the lateral position, and the patient complains of hoarseness. However, one or both cords may be fixed in either position. Naturally, if both are fixed in the midline, there is marked dyspnea. Usually only one cord is involved and it assumes the lateral or respiratory position primarily and remains so from a few days to six months. The cord gradually assumes the midline position, the voice is restored and the patient has very little trouble from then on, except that the tone of the voice may be altered. The midline is the final point of fixation, and is usually assumed in about six weeks. So we can tell the patient with one cord fixed in the lateral position that his voice will return in about six weeks. The cord does not regain motility. It simply moves over to the midline and stays there.

This secondary position assumed by the cord and the reestablishment of the voice after a varying length of time gives origin to the popular idea that many cords are fixed for a time after operation, due to pressure on the nerve from swelling, and that the cord regains its motion after the swelling subsides. This is a possibility and is reported occasionally, but is very exceptional. Hoarseness due to edema of the larynx itself does occur postoperatively, and clears up in a few days, but careful examination will show that the cords are not fixed, although the excursion may be limited on account of swelling around the cricoarytenoid joint.

Now to consider the patient who has both cords fixed. His voice will return, but when it does his difficulties in respiration begin. This varies from a slight dyspnea to a marked obstruction requiring tracheotomy. Usually the condition is severe enough to prevent great exertion, but only occasionally is an emergency tracheotomy required. The patient with both cords fixed immediately after operation should be kept under close surveillance, as the onset of dyspnea may be sudden. I feel that the patient with both cords fixed should be told that the condition exists. In the instance of one cord being fixed I believe it is a mistake to tell the patient that the cord is paralyzed. To the general public the word *paralysis* has a sinister meaning, and as they will have practically no trouble, nothing is gained by telling him of the condition. The average length of time required for the voice to return is six weeks, and only exceptionally does it require longer than three months.

If we keep in mind that in practically all cases the midline position is the position of permanent fixation, the prognosis for the different groups can easily be worked out. If the cord is found in the lateral position shortly after operation, it will assume the midline position later. Thus with unilateral involvement the remote prognosis is good and with bilateral it is bad. When the cord is found in the midline position shortly after operation, it will in all probability stay here. If the fixation is unilateral, again the prognosis is good and in bilateral poor. In the majority of cases the paralysis is permanent, but due to the fact that there are a few cases on record of cords regaining motion as late as two years after operation, it is well to wait this length of time, if an emergency measure is not required before doing any operation that will be destructive, such as the removal of one or both cords or an end to end anastomosis with one of the other cranial nerves.

I have purposely avoided any explanation in regard to the inconsistency of position assumed by the vocal cords after injury to the recurrent laryngeal nerve. Semon's law has served this purpose since 1861. However, it does not explain the fact that the midline position is the position of final or permanent fixation in practically all instances. Experiments on animals have failed to enlighten us, due to the fact that no secondary position is assumed. The fact that the voice in animals is only rudimentary may account for lack of compensatory developments through other muscles and nerves. Of course, experimental works on the human is impossible, but section and alcohol blocking for immobilization is being advocated for unilateral involvement of larynx in tuberculosis. We may learn considerable from watching the motor apparatus of the larynx in these cases before and after treatment.

CONCLUSIONS

1. Excepting due to malignancy, fixation of the vocal cords is rarely found preoperatively in diseases of the thyroid gland.

2. Routine preoperative examination of all thyroid cases will help in establishing the diagnosis of malignancy of the thyroid before operation.

3. The midline is the position of final fixation, and with this in view the remote prognosis can be predicted in practically all cases.

4. Semon's law does not suffice for the observations we are making in the paralyses of the larynx, due to injury to the recurrent laryngeal nerve from surgery in the thyroid region.

METHOD FOR X-RAY EXAMINATION OF THE UTERUS

PRELIMINARY REPORT

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Visible, direct objective evidence will always remain the criterion from which medical judgment of pathologic or physiologic change is adduced. Roentgenologic methods, where applicable, have in the past contributed valuable information and, although objectively the evidence obtained thereby is indirect, in that the shadow or altered radiopacity is the thing judged, still roentgenology offers the nearest thing to visible evidence of deep-seated parts short of surgical or necrologic exposition.

Valuable contributions to the conception of pathology in the respiratory, cardiac and gastro-intestinal organs have been made in the past twenty-five years by the development of roentgenologic practice. It is noteworthy that the visible evidence of early pulmonary tuberculosis as shown by roentgenologic examination gave rise, over a long period, to a controversy between the roentologists and the adherents of physical examination. The result, however, was that persistent observation and report finally established the position of the roentgenologist and the present conception of tuberculous pathology shows considerable modification of the views held a decade ago.

In one field of medicine the advance of roentgenology has been desultory. Diagnosis in gynecology and obstetrics remains a complex of history and physical findings. Since this is one of the oldest and furthest developed branches of medical science, it may be held that methods now extant cover the field. However, in spite of the wealth of observation already had, there are several diagnostic problems still encountered which might be solved more readily, if a laboratory method were available offering visible objective evidence. Pregnancy in doubt, extrauterine pregnancy and salpingitis versus appendicitis are a few of the common problems that might be cleared by a method of roentgenologic examination of the uterus and adnexa.

Pneumoperitoneum was probably the first method proposed which gave a shadow roentgenologically of the internal female generative organs. It is not the scope of this report to review the work done by the many able observers using this method. The failure of pneumoperitoneum to be a routine procedure, universally adopted, is due no doubt to the fact that it is not entirely without discomfort to the patient, and that a careful technic and fairly extensive apparatus for positioning the patient are needed.

A simple method for projecting the uterus with a minimum of temporary discomfort to the patient and requiring no elaborate technic or special apparatus would be desirable. The effect on the patient is of utmost importance, as repeated or periodic examinations can hardly be made on patients who remember disquieting previous experiences.

The internal genitalia of the female are located between two hollow organs, the rectum and the bladder, whose superficial orifices permit ready distension with air. It occurred to the author that, since the well known x-ray silhouette of the heart and thoracic great vessels was possible because of the air-containing lung tissue, the temporary production of a pneumatic field in the bladder and rectum ought to throw the female pelvic organs similarly *en silhouette,* so that their roentgenologic demonstration was possible. A practical experiment was undertaken and the results were successful.

No elaborate precautions are needed for the vesicorectal insufflation. The apparatus used, catheter, hard rubber rectal nozzle and inflating device, are simple. The degree of discomfort produced in the patient is less than that caused by a full enema, for instance; and ready cooperation for repeated examination, when desired, can be obtained. One routine position has appeared desirable to us which requires no special apparatus.

The technic of the method is simple. The bladder is catheterized in the usual manner with the patient prone. While the bladder is emptying, the rectal nozzle is inserted and inflation of the rectum carried out. No quantitative amount is used. The discomfort of the patient is a good guide and in suspected acute infection of the tubes or appendix should be observed carefully, of course. Using the bellows and gum bag ordinarily furnished with the sigmoidoscope, we fill it twice while constricting the soft tube connected with the rectal nozzle and empty it without undue pressure. The procedure is under control of the operator at all times as the bulk of the air is immediately evacuated, if desired, by disconnecting the inflating bag and leaving the hard rubber nozzle in situ. When what is judged to be a satisfactory degree of inflation of the rectum has been attained, the inflating bag is disconnected and attached to the catheter and a small quantity of air under a minimum of pressure introduced into the bladder.

While, as has been said, no effort is made to make the procedure quantitive, it is important, as will be developed later, that the bladder be not overdistended. Danger from emphysema is slight, unless unreasonable pressure is used. Some air, of course, ascends from the rectum into the colon and may cause a varying degree of discomfort. Air embolism is also a possibility, if hemorrhagic vessels are present in either bladder or rectum, so that the judgment of the examiner should be exercised in the selection of cases on which this method is used. To date we have made some fifty odd examinations with no complications or unpleasant lasting symptoms.

After the inflation is concluded, the patient is instructed to turn face down and a film is placed with its lower edge at the level of the symphysis pubis. The table is inclined to what the manufacturers designate the "Trendelenburg position," in order to permit the movable gastrointestinal organs to clear the pelvis, and the x-ray tube centered about two inches above the anus. The exposures are then made. Since we are seeking soft tissue detail, and since the bulk of the pelvis now contains air, the exposure is surprisingly short, being about one-third to one-half the time required for a hip or pelvic bone examination of the same patient.

This is fortunate as one of the questions that will occur to the clinician as an objection to the method is the possible injury by radiation to the embryo, where the method is used in early pregnancy. It is our opinion that the possibility of injury is remote. Even with repeated examinations and several exposures at each examination, the total x-ray dose on the skin does not approach one-quarter of the skin erythema dose and, of course, the deep dose is much less, due to the filtration through superficial and uterine tissue.

The judgment of the examiner is the determining factor as to whether accidents will happen, and it is conceivable that the injudicious use of prolonged repeated exposures might result harmfully to the intrauterine child.

Continuing with our discussion of the method, after a suitable number of films are exposed, the patient may be released and permitted to go to the toilet or if desired she may be held until the films are developed. The ordinary patient experiences no positive discomfort and may lie down or sit erect with the air still in the bladder and rectum without experiencing any added discomfort.

The resultant radiograph ought to demonstrate the corpus uteri and two lateral shadows, whose significance will be discussed later. Examples of "normal" projections are given in figs. 1 and 2.

Since this is a preliminary report based on a relatively small series of cases, exhaustive deductions are not presented as to normal limits of variation or all the characteristic signs of a given pathologic or physiologic change. It has been deemed worthwhile, nevertheless, to report our observations thus far and they are presented herewith, while it is emphasized that further observation may serve to modify some of the statements made in this article.

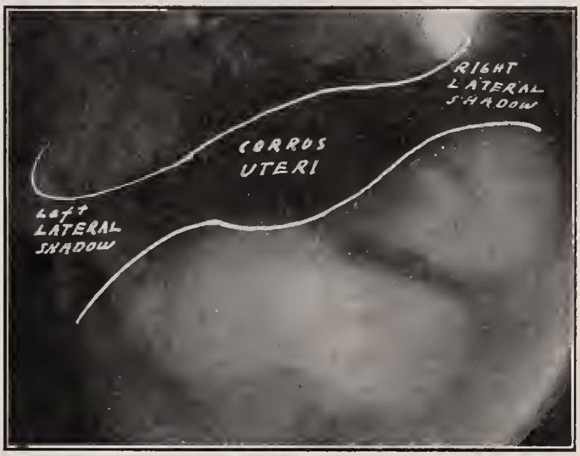

Fig. 1. Mrs. G. G. 5-12-26. Age 30, weight 124. Married eight years. Two children. Moderate lacerations. Menses regular. Negative physical findings.

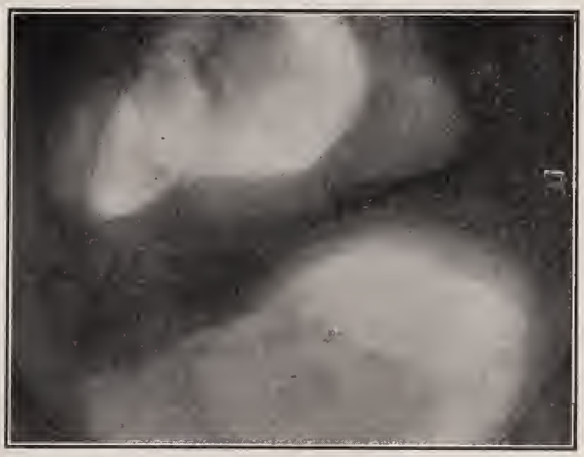

Fig. 2. Mrs. W. B. D. 6-18-26. Age 19, weight 160. Married three years. No children. Menses regular. A recent fall had resulted in bloody intermenstrual discharge. Vagina and uterus negative.

Projections by this method will reveal the following structures: Part of the bony pelvis is outlined, as it partially occupies some of the field under consideration. Two points in connection with the pelvic bones are worthy of mention; first, that the sacrum is constantly projected in relation to the major structures under examination and its edges must be distinguished, so that their shadows may not be confused with deformities of the uterus or adnexa; second, pathologic bony changes may alter the special shadows of the uterine field and, therefore, should be constantly looked for in order to avoid error.

Next it will be noted that the shadows of the rectum and bladder are easily distinguished, due to the contained air. The rectum normally presents the usual anatomic form with the rectal valves clearly distinguishable. These are usually found two on the left and one on the right and are all outlined, if the field covered is large enough. They should be differentiated, especially the one on the right, as it is prone to occur at the level of the right lateral shadow or across the uterine shadow, if it is a well developed projection and may give rise to an anatomic artefact that is misleading if not looked for. Rectal contents should also be distinguished. If they are too confusing, as frequently happens, reexamination should be made after the rectum is washed out with a small enema.

The bladder distended by air does not present the characteristic anatomic form in the female. A roughly crescentic form with rounded "horns" is usually seen. Considerable variation of this form will, of course, be encountered according to the degree of distension. The levels of the "horns" are often assymetric, rising higher on one side than the other. Diverticula or radiopaque contents (calculus or foreign body) can well be demonstrated by inflation as by any other method. The lower half or third of the rectum is seen as an especially dense area through the inflated bladder.

Usually in the midline a well defined characteristic shadow of the corpus uteri can be demonstrated. The vesical margin is most clearly and constantly defined and is termed the anterior border of the uterus. The rectal margin is also constantly demonstrated in the "normal" case but is less sharply defined, due to rectal contents, ileum, mesentery, etc. This margin is termed the posterior border. Each border is usually curved convexly in the midportion with a concave arc for the respective uterine cornua at each side. A ready idea of the size, shape and firmness of the corpus is conveyed by this method of projection.

Extending laterally from each cornua of the corpus are two artificially formed lateral shadows. The lower border of each is formed by the apposition of the distended bladder and broad ligament (mesometrium). This border is also sharply defined and shows the least variation. The upper margin is formed by the distended rectum and probably represents an edge of the uterorectal ligaments of each side. These margins are less clearly defined than the lower margins and are subject to greater variation in the presence of adnexal pathology than the lower lateral margins.

Between the two lateral margins lie the isthmuses and part of the mid portion of the fallopian tubes. No direct shadow of the tubes similar to the direct shadow of the corpus uteri is demonstrated. Conclusions about the tubes are formed indirectly. Very rarely the ampulla of the tube and fimbriated extremity are adventitiously in the pneumatic field and cast a distinguishable shadow.

Since a direct shadow of the tube is not constantly possible and, since the lateral shadows are formed by the edges of the distended bladder and rectum in apposition with the uterine ligaments, no conclusive evidence of the presence or absence of a tube is had. In fact, several of the radiographs presented here are of patients from whom one or both tubes have been removed and, as will be mentioned, the persistence of the lateral shadows gives no clue to the fact that the tubes are absent. It is apparent, however, that when direct shadows of the tubes are essential, it is possible to combine this method with hysterography by lipiodol injection of the tubes.

The majority of attempts to make the projection result successfully. Occasionally failure occurs, but reexamination may be made and, if errors have been committed, their correction at the second examination usually results in a characteristic projection of the corpus uteri and the two lateral shadows.

When the method has been carefully carried out, the resultant radiograph shows the corpus uteri in the midline. Apparently unilateral pathology of the adnexa has a tendency to displace the uterus toward the affected side. In addition to this displacement (which by the way is not a displacement confirmed by digital examination but due to the inelastic condition of the suspensory ligaments of the affected side), there is a fairly common right sided variation which has an anatomic basis.

A long ascending colon with low cecum brings the cecum and appendix in relation to the fimbriated end of the tube and right ovary. Fixation of the cecum to the right abdominal generative organs or pelvic peritoneum may result from a minor irritation. This may occur without symptoms and is really basically an anatomic variation and not a surgical pathology. In these cases the projection of the uterus by the author's method will show a widened right lateral shadow and some obscuring of the outline of the right half of the uterus. The two variations just discussed are constant when present, and are repeatedly demonstrated at successive examinations.

Due to the normal mobility of the fundus, artefacts sometimes occur which suggest deformity which is really not present. During inflation of the bladder the uterus may slip to one side or the other and the result is a projection in which the inflated bladder and rectum are readily distinguished but the uterus is indefinite, showing as an irregular triangular shadow at one side or the other. This is proved to be an artefact, when a second attempt is made and a succesful projection accomplished, thereby differentiating it from the displacement of pathologic significance which is constant.

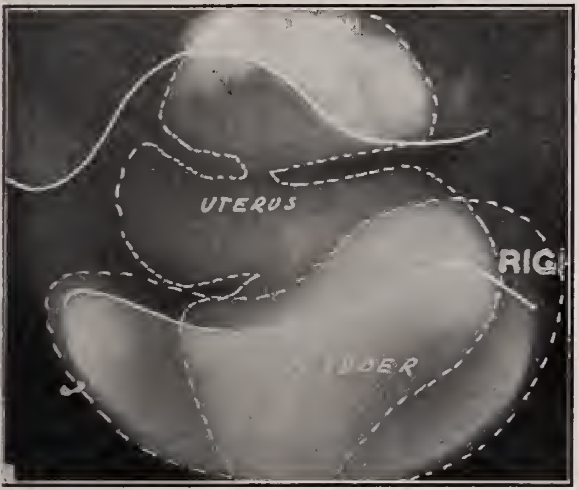

Fig. 3. Mrs. B. F. D. 6-26-26. Age 29, weight 140. No children. Laparotomy for bilateral salpingectomy December, 1925. Extended periods with clots for past several months. Digital examination discloses orange-sized globoid myoma. Note that no indication of the absent tubes is given by the lateral shadows.

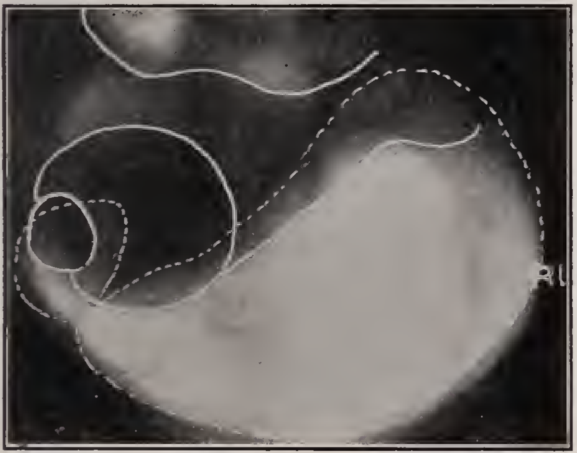

Fig. 4. Mrs. G. E. C. 12-8-26. Age 42, weight 126. Married seventeen years. No children. Laparotomy five years ago, at which time tumor of right cornu removed which pathologist reported adenocarcinoma. Now complains of mass in pelvis, frequent micturition, and intermenstrual bleeding. The constriction of the bladder to the left, where the mass is invading, is well shown here.

In addition to the artefact caused by slipping of the uterus during manipulation of the examination, two other causes of failure have been encountered. They are fecal impactions in the rectum and too rapid or overdistension of the bladder. To avoid the former it is well to instruct the patient to cleanse the rectum by means of a small enema prior to the examination. About a pint is sufficient. A thorough enema is not advisable as, when the colon is fairly empty, the introduced air passes up the colon too readily and it is difficult to obtain the slight pressure in the rectum that is necessary for distension. The second error can readily be avoided by using only gentle pressure in inflating the bladder and no great quantity of air.

Figs. 3 and 4 are reproductions of uterine tumors. Fig. 3 is the ordinary myoma of relatively small size. It is of greater interest, however, than is implied by a projection of a fairly common pathology, readily recognized by the usual methods. That is, it serves to illustrate several important points in connection with the interpretation of these projections.

As has been observed, it is not possible to project a direct shadow of the fallopian tubes by this method. This point is well illustrated in this particular case, as the characteristic lateral shadows are demonstrated here and give no evidence of the absence of the tubes.

Another point worthy of observation is that the true border (vesical) of the uterus is often seen through the bladder and not at the edge of the distended bladder. Thus the anterior margin of this uterus is the lower limit of dense tissue closest to the symphysis and not the second line seen immediately above, where the bladder contacts with the uterus more anteriorly. Stereoscopic projection is easily performed and a study of the three organs with the depth levels apparent gives one a clear idea of how this artefact is formed. However, the flat radiographs are susceptible of correct interpretation, if the detail in the bladder region is not obliterated by overexposure. This point is emphasized here in order that no error may be made in a proximate estimate of the size of the uterus.

The last point illustrated by this radiograph (fig. 3) cannot be explained in as concrete terms as might be wished. Just as the roentgenologist gains a sense, empiric though it may be, of what is the "normal" prominence of linear markings in the lungs, for instance, or what is the "normal" density of a paranasal sinus, so, it will be found, that after a study of projections made by this method some idea of the consistency, firmness or softness may be gained from the appearance of the aggregated shadows.

Fig. 4 illustrates a tumor originating in the uterus and invading the bladder. The history of former malignancy, proved by microscopy, and the bladder invasion are suggestive of malignant recurrence. The somewhat quadrangular dense shadow seen to the left is probably a satellite-involved lymphatic gland.

Tubal pathology seems to be indicated by variations of the lateral shadows. As will be noted by referring to the "normal" projections, the lateral shadows are fairly symmetrical, their width is less than the widest portion of the uterus and they seem to be arranged at each side of the corpus uteri and do not encroach on the posterior border of the uterus. We have found many instances in which assymmetry of the lateral shadows is presented, one side being considerably widened and otherwise altered from the normal. Our observations have not been extensive enough to warrant the assertion that this widening is always associated with clinical pathology. However, that chronic salpingitis may underlie this distortion seems to be true in some cases. It appears that pathologic alteration which causes gross anatomic change in the size of the tube is certainly responsible for a characteristic distortion.

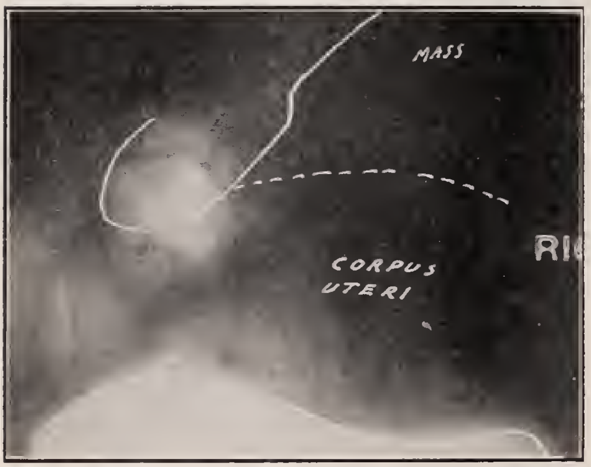

Fig. 5. Mrs. V. S. 3-15-27. Age 41, weight 131½. Never pregnant. Menses regular. Very little pain. Orange-sized swelling in right vault which is tender; uterus retroverted and slightly enlarged.

When the distortion takes place on the right side only, its significance is of less differential value, as we believe scars about an appendix or cecum may cause a permanently wide right lateral shadow that is not associated with tubal pathology. On the left side, however, distortion of the lateral shadow should always raise a suspicion of pathology of the left tube or ovary.

Figs. 5, 6, and 7 are presented to illustrate the degree of distortion or variation seen in the lateral shadows. In fig. 5 the upper margin of the right lateral shadow is lengthened, distorted and displaced to the left so far that the posterior border of the corpus is completely obscured. In addition a flattening of the rectum on the right side may be observed. In the presence of the swelling of the right vault, demonstrable by physical examination, this appears to be an actual mass, probably an abscess of the right tube.

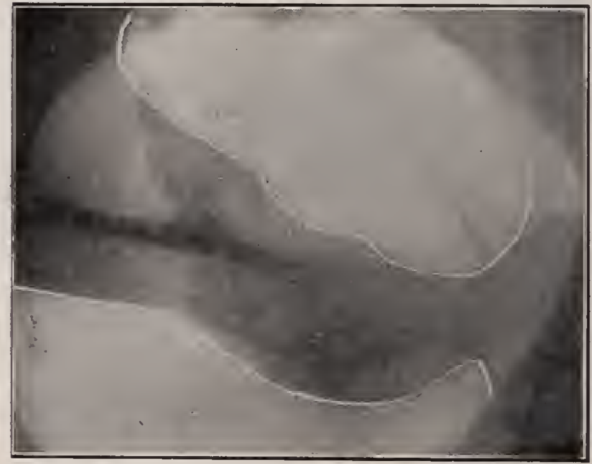

Fig. 6. Mrs. C. O. B. 5-19-27. Age 18, weight 120. No pregnancies. Menses regular with pain in back and abdomen; presents herself complaining of pain in lower abdomen on both sides. Digital examination indicates double tubal infection.

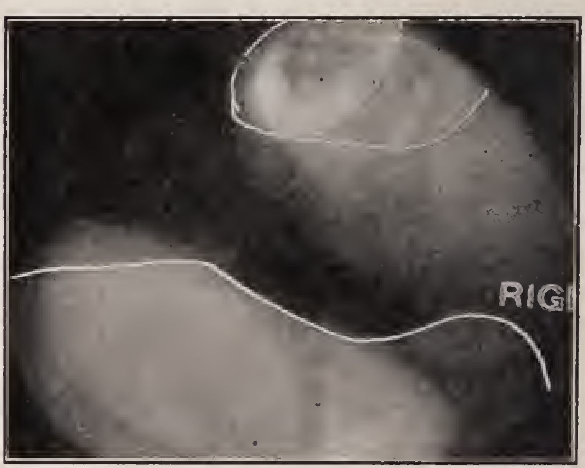

Fig. 7. Mrs. V. M. Age 30, weight 145. Nullipara. Pyrexia and leukocytosis with pain localized to both sides of abdomen, low down, for past three days. Digital examination indicates right tubal infection.

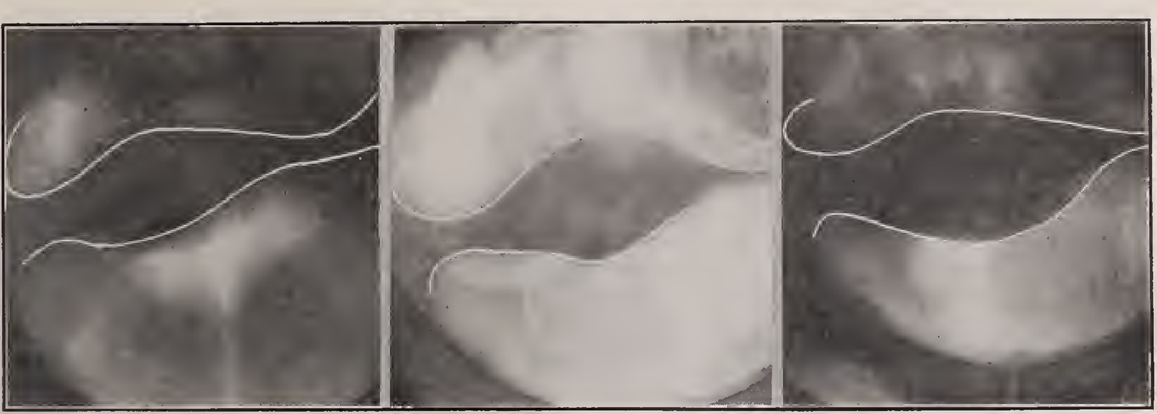

Fig. 8a. Fig. 8b. Fig. 8c.

Fig. 8. Mrs. J. W. Age 34, weight 120. One child, eight years old. Menses regular until period missed on 5-14-26. Examinations: 8 A, 5-28-26, 8 B, 6-5-26, 8 C, 6-15-26. On 6-15-26 digital examination was typical of early pregnancy.

Fig. 6 delineates a bilateral distortion of about the same degree on each side. Here, although the posterior border of the uterus is still definable, the lateral shadows are so increased in width that the narrowing of the corpus for the cornua and isthmuses of the tubes is obliterated. There is probably no such degree of enlargement of the tubes as would correspond to the width of the lateral shadows. The increased size of the shadows is probably spastic in character. This would seem to be the alteration to be expected as typifying a chronic salpingitis without the actual tubal enlargement of pyo- or hydrosalpinx.

Fig. 7 illustrates the type of projection encountered with a bilateral acute salpingitis. Here the spasm of the uterorectal ligaments is of such degree that no relaxation was attained but it will be noted that the upper rectum is not deformed or displaced, indicating that no actual mass is present in either tube area.

The three projections presented are fairly typical and the anatomic alteration suggested by the roentgenologic deformities corresponds closely with the clinical findings. However, our observation to date indicates that deformity of the lateral shadows may be encountered when frank clinical evidence of tube pathology is lacking, so that final judgment on the true significance of the distorted lateral shadows must be withheld until a greater number of correlated physical, roentgen-ray and surgical findings are at hand. It would seem proved, however, that palpable masses or swellings coupled with a distorted lateral shadow are of pathologic significance.

A discussion of the variation of the lateral shadows was essential before we could present our observations of the demonstrable changes in early pregnancy. Anatomic observations of the early pregnant uterus emphasizes three important changes: extension of the uterus into and obliterating the isthmuses of the tubes, softening, and progressive, rapid increase in size. Since the size and form of the corpus can readily be determined by the author's method of projection, it was hoped that a characteristic form of an early pregnant uterus could be observed that would serve as a constant diagnostic sign in the presence of other confirmatory subjective signs. We still feel that, as evidence accumulates, such a characteristic form will be observed much earlier than it can be demonstrated by digital examination. However, on account of the frequency with which variations of the lateral shadows are encountered which obscure the all important region of the origin of the isthmuses of the tubes, it is more advisable to study the patient at suitable successive intervals for a rapid, progressive change which it would appear can be demonstrated at a surprisingly early period after cessation of menses.

This progressive change will have the characteristics of obliterating the isthmuses of the tubes, a measurable increase in the size of the uterus, especially as measured from side to side, and an increasing softening of the uterine walls so that they accommodate to the pressure of the distended bladder and rectum.

Three series of studies of early pregnancies are presented in figs. 8, 9 and 10. The series in fig. 8 represent ideal results in early recognition both of the characteristic change and the progress of the change. This recognition is facilitated by the "normal" lateral shadows. Referring to the illustrated normal shadows, it will be observed that the central portion of the fundus uteri is represented by two short convex arcs and that the respective cornua

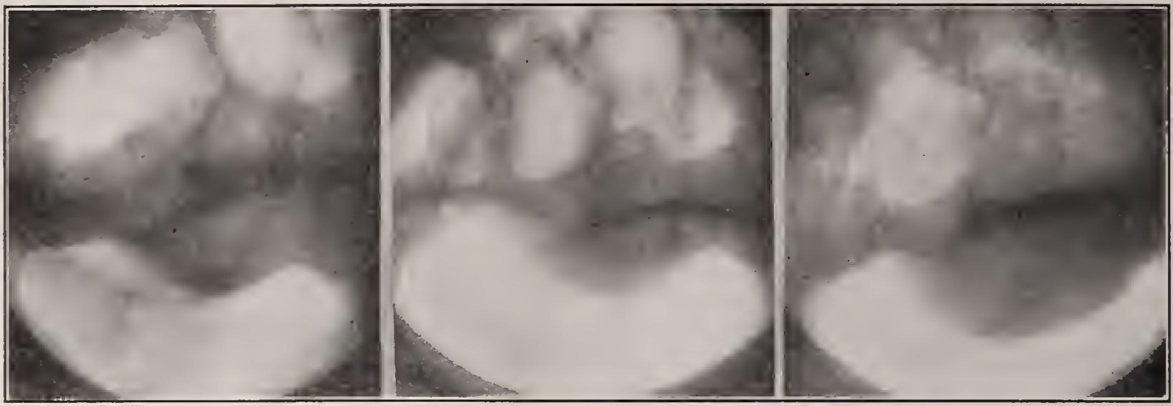

Fig. 9a. Fig. 9b. Fig. 9c.

Fig. 9. Mrs. P. I. M. Age 27. weight 104. Married two months. Menses negative until first period missed 7-2-27. Examinations: 9 A, 7-8-27, 9 B, 7-23-27, 9 C. 8-9-27. On 8-9-27 digital examination was still doubtful.

and origin of the tubes are represented by two short concave arcs continuous with each convex arc and concave on both posterior and anterior margins of the uterus. This would seem to correspond topographically to the accepted anatomic concept of the normal uterus.

Referring to fig. 8 A, which is the projection at the start of the study, it will be recognized that the concavities at either side of the uterus are disappearing and that the uterine margins are now represented by a wide sweeping single convex arc instead of three component curves. This is what we would expect to occur as a result of the invasion of the isthmuses of the tubes by the expanding uterus. The normal anatomic form is altered to what might be described as a spindle shaped uterus. This is the sign which we had hoped would characterize the early pregnant uterus of three or four weeks duration. Unfortunately its constant reliable demonstration is dependent on normal relaxation of the ligaments to form undistorted lateral shadows, and as has been stated, abnormal lateral shadows are frequently present.

Therefore, it has seemed advisable at present to check the uterine changes for rapid progress. The interval between examinations need not be long and definite advance appears to be demonstrable with intervals as short as one week. Each of the published series was carried further than was necessary to establish the progress, the third study serving as a confirmation.

Reliable conclusions can be formed by comparison of the first observation with the second in each case presented. The interval in series fig. 8 between the first and second observations was two weeks and progressive changes (increased size) can be determined by comparative measurement. The interval between the second examination and the third was again two weeks. As the first observation was made two weeks after menses ceased, the series represents the progress of the uterus in six weeks. There is a striking contrast in any one of the series as compared to any other of the series, and the progressive character of the changes is easily seen.

Fig. 9 illustrates a series that was begun six days after the missed period and continued with observations every two weeks so that the final observation represented five weeks pregnancy. Due to the widening of the lateral shadows, especially of the right side which partially obscures the posterior border of the corpus, it was unsafe to draw conclusions as to the uterus invading the tubes from a single examination. However, the progressive change shown at examination two weeks later, which by the way was slightly less than three weeks after cessation of menses, is very suggestive of normal pregnancy. Further convincing proof is presented in the last examination of the series made four weeks after the first observation, where inspection immediately shows a rapid progress of the uterus laterally, obliterating the isthmuses of the tubes. A positive report, however, was rendered at the second observation which was but three weeks after menses ceased.

The next series in fig. 10 represent but three weeks pregnancy in all. The first observation was made five days after menses ceased and studies repeated each week thereafter for two weeks, making the end observation three weeks after cessation of menses.

The progressive change represented by comparison of 10 A and 10 B is evident but probably approaches the limits of variation we would have to allow, so that it is really too early to be reliable.

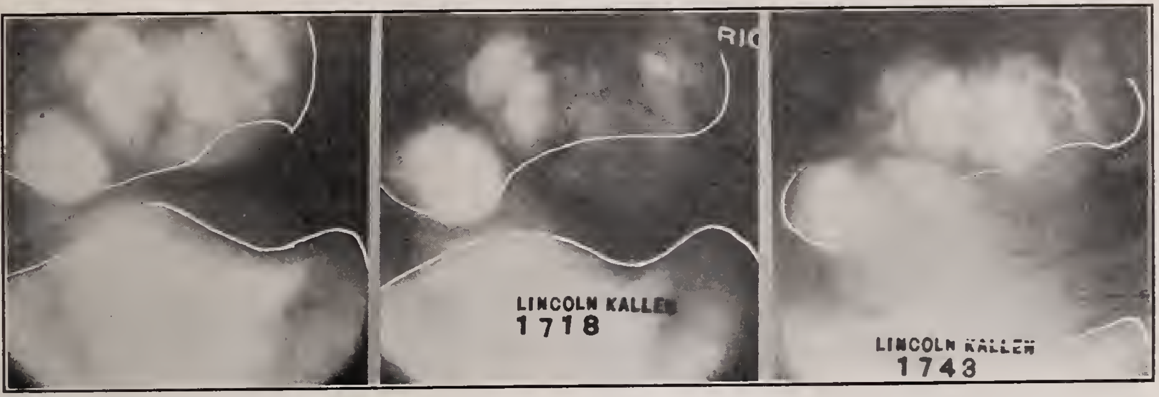

Fig. 10a. Fig. 10b. Fig. 10c.

Fig. 10. Mrs. J. H. M. Age 41, weight 138. No children. Underwent operation for ruptured tubal pregnancy 5-3-26, at which time right tube was removed. Menses regular but scanty. Missed 7-24-27. 10 A, 7-29-27, 10 B, 8-5-27, 10 C, 8-12-27. Note that the total period for this series is but three weeks.

The change apparent from 10 A to 10 C is unmistakable, however, and is characteristic of early pregnancy.

To summarize the possibilities of this method in helping to recognize early pregnancy, it would seem advisable to base conclusions for the present on successive observations at short intervals and to report positively when characteristic, rapidly progressing alteration of the uterine silhouette is present. If the patient is seen within a week or two after the first missed period, an observation followed by a second after the lapse of two weeks should suffice. If the patient is first seen three to six weeks after the missed period, the interval to the second observation may be shortened to a week. In most cases pregnancy that has progressed six weeks or more presents a sufficiently characteristic appearance at the first examination, though we feel comparative observations are more reliable, since there are probably individual variations in the physiologic rate of change in the early pregnant uterus.

Fig. 11 illustrates the possibility of a single observation in early pregnancy of six or more weeks duration. The patient's menstrual cycle was short (twenty-one days) and she had missed three periods at the time seen. Her complaint was a sharp severe pain in the lower right abdomen (appendix had been removed). Two clinicians had not found a characteristically pregnant uterus by digital examination. The roentgen report was a probable right salpingitis and a uterine pregnancy at about eight weeks. The patient was treated medically, but about weeks after examination spontaneous abortion occurred and the right pelvic disturbance subsided.

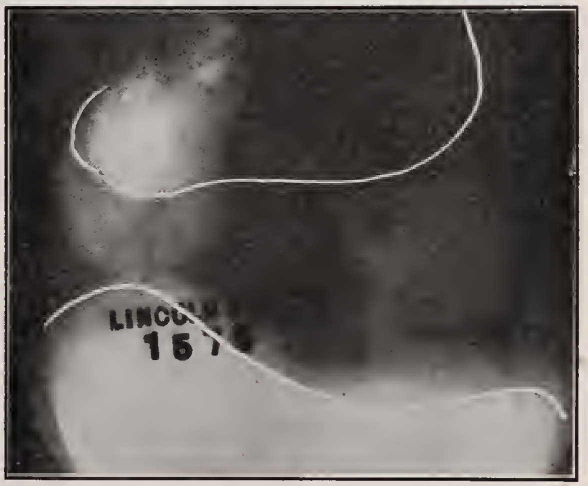

Fig. 11. Mrs. J. P. D. 7-29-27. Age 33, weight 135. Nullipara. Menses every 3 to 3½ weeks. Married six months. Has not menstruated for three periods. Digital examination reveals very tender and doughy mass in region of right tube. Sharp pains here for past two weeks.

It would seem, then, that reliable evidence of early pregnancy can be elicited by this method in the ordinary case at about three weeks and sometimes earlier. It was mentioned in the introduction that a method of projecting the uterus by roentgen-ray might offer an early diagnostic sign of extrauternine pregnancy. It would appear that, when the clinical suspicion of pregnancy is very strong and successive examinations fail to reveal progressive uterine changes or pathology of the adnexa which might cause suppression, an extrauterine pregnancy should be suspected. Whether a characteristic distortion of the lateral shadows will also serve as a localizing sign, when the pregnancy is tubal, remains for further observation to demonstrate.

The routine demonstration of the ovaries does not seem probable, when this method is used, as the pneumatic field is not large enough to cover their areas. However, new growths or other ovarian pathology resulting in gross increase in size often cast characteristic shadows.

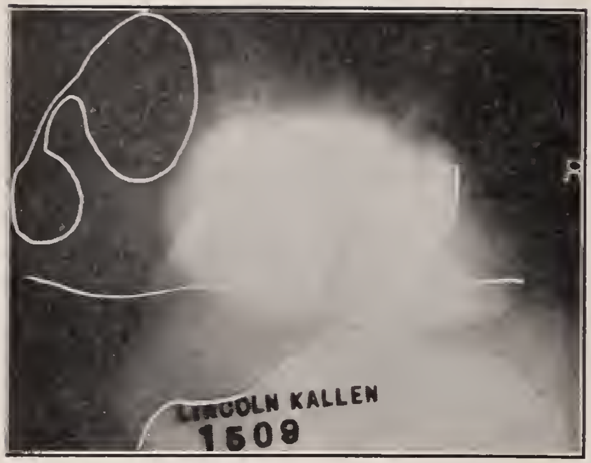

Fig. 12. Miss F. H. 3-21-27. Age 23, weight 125. Menses irregular for past eighteen months. One week overdue at time of examination but remembers sixty day intermissions. Vagina and uterus negative.

Fig. 12 demonstrates how a gas filled sigmoid flexure may sometimes show a small ovary. The original radiograph shows the fimbriated extremity of what is probably the left ovary and above and what is probably the left ovary and above and towards the midline an oval, fairly dense shadow of a tumor mass apparently attached to the ovary by a pedicle. While the possibilities of demonstrating the ovary are greater on the left side on account of the sigmoid, we have also recognized what appeared to be right ovaries in some cases.

In closing it is well to reaffirm that x-ray shadows are a form of visible objective evidence. It has been our experience that variations have been encountered between the findings by this method and what clinical examination would seem to indicate. While our series of cases is small, we are led to believe that what we see by this method is characteristic at an earlier time than what can be felt by digital examination in early pregnancy.

It would seem to us that this method is advantageous for use where physical examination is unsatisfactory. For instance, in the adipose abdomen or in the virgin where rupturing the hymen is not allowed. We feel, too, that the closest correlation between all the facts that can be elicited by clinical and surgical methods will be necessary before the correct interpretation of all distorted lateral shadows is arrived at.

Since the position of the uterus is determined in the radiographs by artificially produced conditions, we do not feel that satisfactory conclusions as to retroversion or anteversion could be made from this type of examination.

250 Stockton Street.

RUPTURE OF UTERUS DURING PREGNANCY FOLLOWING CESAREAN SECTION*

Glenn N. Rotton, M.D.
SEATTLE, WASH.

On July 28, 1925, a patient with very interesting and unusual symptoms and physical findings came under my care in the obstetric department of the University Hospital at Iowa City, Iowa.

CASE REPORT

Mrs. I. R., age 25, para II, married. The family history is essentially negative. She was operated on for appendicitis at the age of sixteen with no postoperative complications. On November 1, 1920, after forty hours of ineffectual labor a classical cesarean section was performed. No postoperative complications arose.

In the history of her present pregnancy the last menstrual period started December 15, 1924, and quickening was experienced March 7, 1925. Nausea and vomiting were unusually marked during the first twelve weeks. Since June she complained of headache, blurring of vision, frequent attacks of epigastric pain and edema of the extremities. Four days prior to her admission to the hospital she was seized with a severe, dull, aching pain in the abdomen, located diffusely above the umbilicus. At the onset she felt very light headed and dizzy but did not faint. The discomfort in the abdomen persisted and shortly after the onset the abdomen began to increase in size, the walls becoming very tense. Within a few hours after the onset of pain and swelling vomiting appeared as a symptom. Attacks of nausea and vomiting increased in frequency and severety and there was increasing difficulty in getting the bowels to move.

On admission to the hospital patient was having frequent emeses of dark colored material with a fecal odor and only at long intervals was she able to pass gas through the rectum. She had had no chills or fever and there had been no vaginal bleeding. She had not felt fetal movement for seven days.

With the above history the patient was first admitted to the surgical outpatient service. Here the diagnosis of intestinal obstruction was made and the suggestion offered that the pregnant uterus might be the cause of the condition. Accordingly she was transferred to the obstetric service.

Physical examination showed a patient of about stated age, pale, restless, apprehensive and at frequent intervals vomiting dark colored and foul smelling material. She complained of no sharp pain but said the entire abdomen felt uncomfortable and tight and because of this it was hard for her to breath freely. The sclerae were slightly ichteroid, mucous membranes were a pale pink and the entire skin surface a pasty, yellowish white. Heart and lungs were negative. The abdomen showed marked distention and the walls were very tense, the skin being smooth and shiny. Peristalsis was not visible. Palpation showed the abdominal walls to be under great tension. Because of this an irregular mass could be made out with uncertainty and it seemed to occupy the upper part of the abdomen. With the exception of the upper flanks the percussion note was tympanitic throughout. Diffuse tenderness was present over the entire abdomen. Fetal heart tones and fetal motion were absent. The ankles and legs up to the knees were edematous. Temperature 99°, pulse 96, respirations 28. Urine showed a trace of acetone and a few pus cells. The hemoglobin was 30 per cent (S); r.b.c. 1,710,000; w.b.c. 16,250.

The diagnosis of dead fetus was added to that of intestinal obstruction and it seemed advisable to empty the uterus in a conservative manner. Rupture of the uterus was considered at this time but the symptoms seemed far from typical and the patient's condition did not call for radical procedure. She was watched carefully during the night and was given 1500 c.c. of normal saline under the skin. Enemas and gastric lavage were given in an effort to relieve the abdominal distention.

At 11:35 the next morning her condition was unchanged. Vaginal examination revealed a soft, patulous cervix which was easily dilated manually enough to take a No. 6 Voorhees bag. A two pound weight was attached to the bag. During a period of twelve hours there was no evidence of uterine contraction. In the meantime gastric lavage and enemas had served to lessen the abdominal distention somewhat and the mass could be made out more distinctly. It was located mainly above the umbilicus and small parts could be made out indistinctly. At midnight the bag was removed. The cervix was dilated to 2.5 cm. Digital examination showed a uterine cavity with nothing in it. As far as the finger could reach the walls of the uterus were intact. Temperature 101°, respirations 34, pulse 108.

Because of the low hemoglobin and red cell count the patient was given 500 c.c. of citrated blood by transfusion. One half hour later her temperature was 103°, pulse 148 and respirations 36. This was soon followed by a chill which lasted thirty minutes. The temperature then dropped to 100.4° and the pulse to 120.

By nine o'clock the next morning the patient's condition was much improved. Temperature 100°, pulse 120, hemoglobin 40 per cent; r.b.c. 2,370,000; w.b.c. 17,050.

Under ethylene anesthesia a long midline incision was made below the umbilicus. The subcutaneous tissues were bloodless and the abdominal contents showed blue-black through the tense peritoneum. The abdomen was filled with old blood clots. There was no evidence of active bleeding at the time of operation. Clearing away the blood clots so the uterus could be seen, it proved to be about the size of a four and a half months' pregnancy. The walls were firmly contracted and the entire fundus from tube to tube appeared to be "blown away," there remaining a rough, jagged crater 5x6 cm.

The remainder of the abdomen was then explored. On the left side, under the diaphragm, adherent to it and to adjacent structures, was found an unruptured fetal sac. Adhesions were easily broken down and the mass was removed. On the right side and also adherent to the diaphragm was a similar mass—placenta, membranes and fetus. This was removed without difficulty.

The transverse colon between the two fetal sacs was greatly distended and was dark in color. When the two masses were removed gas escaped readily from the colon. No other obstruction was found.

Attention was then turned to the uterus. The organ was damaged beyond any hope of repair and was removed by supravaginal amputation. Both tubes and the right ovary, which was cystic, were removed. Abdominal closure was made in layers with a cigaret drain into the vagina from the cul de sac and one iodoform drain out through the abdominal wound.

When the fetal sacs were opened the liquor was found to be dark and cloudy. Both babes showed extensive maceration of the skin, evidence that they had been dead for some little time. One babe, a male, measured 41½ cm. and the other, a female, measured 42 cm. in length.

The postoperative recovery was very slow, the temperature remaining around 101° for twenty-four days. There was profuse drainage from the abdominal wound and from the vagina. This drainage lessened gradually and the patient walked from the hospital on her thirty-sixth postoperative day after her temperature had been normal for ten days.

The report of this case illustrates a condition which occurs rarely but which practically always carries with it disaster in the form of death of the mother, death of the babe or both. Recent literature indicates that rupture of the uterus through the site of the previous incision occurs in from 1 to 4 per cent of the subsequent gestations and certain authors consider it so real a danger that they have laid down the dictum: "Once a cesarean, always a cesarean."

That it is impossible for any patient who has had a cesarean section to be delivered by vagina in a subsequent pregnancy is absurd. Many patients have been delivered either spontaneously or by easy forceps operations, and rarely by version, with perfectly satisfactory results. On the other hand, a certain small percentage have suffered rupture of the uterine scar, either during pregnancy or labor in later pregnancies. In spite of this apparent infrequency, however, the nature of the accident is so grave that one must keep the possibility of the emergency constantly in mind.

When this accident has occurred, the majority of the patients have died from hemorrhage or peritonitis. A sufficient number have shown such slight symptoms from the rupture that it is not possible to predict that even rupture of the uterus, when it occurs, is necessarily the dangerous accident in these cases that it is when it occurs during labor as a result of overstretching of the lower uterine segment or of improper operative procedures.

There is great difference in the frequency of rupture after the old cesarean section as compared with the results following the new or modern operation. Before the time of Sanger the method of suture of the uterus was not satisfactory. Krukenberg, in 1886, stated that after the old operation 50 per cent of all cases resulted in rupture of the uterus during subsequent pregnancies. He reported twenty cases of rupture through the scar with a mortality of 50 per cent.

Since the adoption of the Sanger method of suturing in tiers the incidence of rupture has been much lower. From 1882 to 1895 Sanger reported 500 cases without a rupture. From 1895 to 1911 40 cases of rupture were reported. For the last five years to 1926 at Touro Infirmary, out of 3,096 cases two of rupture through the scar were reported and one case out of 5,555 at Charity Hospital. Broadhead (1906) gathered in five years records of 18 cases of rupture following cesarean section and added two, making a total of 20 reported cases. This was increased to 97 by Holland in 1920.

A great many points have been brought out as possible etiologic factors in the production of rupture through a preexisting cesarean scar. For a long time it was the common belief that the uterine incision healed by the formation of scar tissue and that the newly formed connective tissue stretches and sometimes yields when the uterus becomes distended.

Williams holds that such a belief is erroneous and proves this in three ways. "First. Inspection of the unopened uterus at the time of repeated section usually shows no trace of the former incision or, if present, it appears as an almost invisible linear scar. Second. When the body of the uterus has been amputated no scar is visible after hardening, or at most a shallow vertical furrow is present upon the external and internal surfaces of the anterior uterine wall, while between them no trace of scar tissue is apparent. Third, and most important. Histologic examination of the site of the incision shows that the uterus, just as all other organs made up of nonstriated muscle, heals by regeneration of the muscle fibres and not by scar tissue. Even when the healing has been so imperfect that marked thinning has resulted, the tissue which remains is almost entirely muscular in character."

On the other hand, it is a common experience, in performing repeated cesarean sections, to find either a very thin scar at the site of the previous uterine incision or that in a portion of the old wound the uterine musculature has separated and the fetal membranes or placenta are covered only by peritoneum, even in patients where no history of infection of the wound at the previous operation can be obtained and when the operation was performed by a competent surgeon.

Every authority agrees that, in a patient who has run a febrile postoperative course, it can be rightly assumed that the wound was infected and, therefore, the resultant healing has been defective. Imperfect healing of the endometrium or proliferation of the endometrial tissue into the musculature of the uterus is another factor productive of a weak line of union. In case the incision is into the placental site there may be imperfect healing, due to the degeneration of the decidua serotina, or the scar may be weakened by the inclusion of decidual tissue in the muscle wall.

There is not much evidence to uphold the view that the syncytium attacks the well healed scar. It is probable that the proliferating syncytium is more apt to attack the poorly healed scar. In two reported cases this tissue had extended into the scar and through it to the serosa.

Williamson reports a case of rupture through the cesarean scar. He believes healing of the uterine incision probably takes place, as described by Couvalaire and Schwarz and Paddock, first, by a deposition of fibrin and then by fibroblastic proliferation. In the perfect scar there has to be good wound apposition. Then the line of the scar is small and as it contracts it assumes the appearance of the normal uterine wall. Any interference with the healing will cause an abnormal amount of connective tissue which will result in a weak scar that may separate during labor.

Infection is the usual cause. In this reported case pathologic findings by Dr. Ewing showed fibrosis and atrophy of muscle tissue, chronic inflammation, leukocytic infiltration, dilatation of veins with decidual cell infiltration on the inner surface.

In support of the view that the endometrium prolifierates or in some way gets out of the uterus and lives, Schwarz reports a case who previously had a cesarean section. She complained of a small nodule in the abdominal scar which at intervals increased in size and became very painful. Because of these symptoms the nodule was removed and microscopic examination proved it to be typical endometrial tissue, overlying endometrial stroma. In uterine scars which he has examined he has found two cases which showed endometrial tissue incorporated in the musculature of the uterus.

With these predisposing conditions in mind it is necessary only to mention some of the causative factors. In this connection such things as unusual distention of the uterus in cases of multiple pregnancy, hydramnios and large babies must be considered. Malpositions of various types, especially transverse positions, are important, also direct trauma to the uterus from a blow, a fall or from straining are other factors. Any of these conditions may have their effect in late pregnancy before labor sets in. If the scar has been strong enough to withstand this strain, it has yet to undergo the added strain of labor.

The symptoms of actual rupture of the uterus vary considerably. In this case report the patient complained only of a dull, aching pain in the abdomen and general weakness, and did not think her condition serious enough for medical attention until the secondary symptoms of intestinal obstruction appeared. These mild symptoms are found in many patients and they may show no further evidence of trouble until some time later as the result of infection or putrefaction of the fetus.

In other patients the more typical symptoms of rupture are present. In these, whether the rupture occur during labor or late in pregnancy, there is the initial acute, lancinating abdominal pain. Soon after the actual rupture evidence of collapse supervenes, the pulse increases greatly in rapidity, loses tone and takes on a filiform character. The face becomes pallid, assumes a drawn appearance and is covered with beads of sweat. If the hemorrhage is very severe, the patient will complain of chilliness, thirst, air hunger and disturbances of vision, eventually passing into an unconscious state.

Symptoms of collapse, however, do not always appear immediately but are sometimes deferred for several hours, being less marked when the rupture is partially plugged by the fetus or placenta. The forming of a large hematoma may defer symptoms of shock or collapse until secondary rupture into the peritoneal cavity. While the symptoms of hemorrhage may be perfectly apparent there may or may not be vaginal bleeding.

The physical findings are quite characteristic unless masked by some other condition, e.g., the intestinal obstruction in the case reported. The contour of the abdomen will change from that of a normal pregnancy. In very evident cases, where the abdominal walls are thin, the bulk of the tumor mass will be found high with a smaller mass, the contracted uterus, lying above the symphysis. Fetal heart tones will cease and there will be no evidence of uterine contraction. Palpation will reveal the fetal small parts unusually distinctly.

Vaginal examination may or may not reveal hemorrhage. Palpation will show that the presenting part has slipped away from the superior strait and has become movable, while a hard, round body, which represents the firmly contracted uterus, can be felt alongside the fetus. Naturally, if the uterine contents have escaped into the abdominal cavity, the presenting part cannot be felt on examination.

The temperature at the start is subnormal, later rising as infection starts in. The blood picture is that of an acute secondary anemia. Later, with infection, there is a rather marked leukocytosis.

The pathology to be considered in this paper is merely the rupture of the uterine wall through the site of a previous incision. As in the case here reported ,the rupture may be complete, involving the entire length of the previous incision and allowing the contents of the uterus to escape into the abdominal cavity. In this event the uterus shows a large, crater-like opening, the edges of which are rough and jagged and covered with clotted blood and fibrin. The microscopic picture of this torn edge differs with various men. It is a fact that infection in the line of suture leaves its mark and in these cases there is fibrous connective tissue in abundance. Syncytial tissue and endometrial gland tissue have been described as being present.

The rupture may involve only a part of the previous opening which is not large enough to allow the escape of the fetus and placenta but at the same time permits severe hemorrhage. The fetus or placenta may be found plugging the opening in the uterus. Early after rupture the abdomen is filled with free blood and new clots, the product of conception in the uterus plugging the opening or free in the abdominal cavity.

Later, adhesions, fine and easily broken down, are found involving uterus, fetus and intestines. Later still evidence of infection is present, either in the form of a metritis, suppuration of the fetus or a generalized peritonitis.

Rupture of the uterus carries with it a high mortality. Cases following the old type of uterine repair had a mortality of 50 per cent. Broadhead reports 15 per cent mortality in 16 cases. Dorland in 1901-03 reported a mortality of 24 per cent in 50 cases. Tranoff of Moscow Maternity (1877-1901) reports 124 cases with 79 per cent mortality. Lobenstine reports 37 cases with 81 per cent mortality. For the babe the death rate is very high, in the neighborhood of 80 per cent.

All manner of suggestions have been made for treatment of rupture. These include such things as delivery of the fetus and placenta through the normal passages by version and extraction, forceps, craniotomy, embryotomy, etc., and following this by tamponing the uterus for control of hemorrhage. It is very apparent that this type of treatment adds materially to the shock and collapse of the patient, contributes to her chances for infection and in the end leaves the control of the hemorrhage from the rent in the uterus out of reach.

I am sure I am safe and right in saying that laparotomy as soon as the diagnosis is made is the recognized procedure of choice, no matter what the character of the tear or the extent of the hemorrhage. It is only by opening the abdomen that one can be assured against any further risk of hemorrhage.

After the abdomen has been opened and conditions determined, there remains only to decide on suture of the rent or hysterectomy. It is not so simple to repair the rent by suture for in many instances the wound conditions are so complicated and the edges so damaged by hemorrhage and trauma that accurate coaptation by means of suture is out of the question. Furthermore, the fact that the patient has probably already been infected would contraindicate any attempt to conserve the damaged tissues. Therefore, it would seem that the best results are to be obtained by amputation of the uterus.

The question of prophylaxis or prevention of rupture cannot be stressed too much. Such things as asepsis, time of operation, type of operation and technic must be kept foremost in mind. It goes without saying that aseptic technic in its highest degree should be aimed at in doing a cesarean section. The possibility of perfect technic is hindered somewhat in every case by the escape of potentially infected liquor amnii into the peritoneal cavity. In every instance this should be reduced to a minimum.

There is some question as to whether the classical or the low cervical operation offers the best result and the least chance for rupture. From the literature I gather that the majority feel the low cervical operation offers less probability for rupture in subsequent pregnancies. Phaneuf in a series of collected cases reports 25 per cent rupture following the classical operation and 3 per cent following the low cervical method.

Whether the incision be made through the fundus, the anterior wall of the uterus or in the lower uterine segment, it remains that the thing of paramount importance is careful coaptation of wound edges. While there is some difference of opinion, most authorities advise against sutures passing through the endometrium, feeling that in putting sutures through this tissue there is more possibility of infection and at the same time danger of carrying endometrial tissue into the uterine muscle which might hinder good healing. Probably the best method is to close the wound in tiers or layers. These rows of sutures may be continuous or interrupted. The suture material best adapted is No. 2 chromic catgut. The first layer includes muscle down to the mucosa. The second row also includes muscle and interdigitates with the first. The third includes muscle and serosa and also interdigitates with the second. A fourth row serves to peritonealize the line of repair, bringing up the loose bladder peritoneum and overlapping the serosa. The sutures in uterine musculature as well as in any other muscle tissue should be tied snugly but not tight because of the pressure necrosis which is apt to follow. This manner of bringing together the edges of the wound in layers makes for the best possible result in the repair of the anterior wall defect, leaving a type of scar that can best be trusted with the strain in subsequent pregnancies.

CONCLUSIONS

1. Rupture of the uterus through a postcesarean scar is comparatively rare but carries with it a definite danger to mother and babe.

2. The cause of rupture may be located primarily in a defective scar with such exciting causes as unusual distention, malpositions, accouchement forcé and trauma.

3. The symptoms are not always characteristic and may be masked by other conditions.

4. Laparotomy is the safest method of treatment with possibly repair of the laceration or more probably supravaginal amputation of the uterus.

5. Every uterus following cesarean section should be sutured carefully in layers with the intention in mind that it will withstand the strain of subsequent pregnancies.

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THE WASSERMANN REACTION IN PREGNANCY, LABOR AND PUERPERIUM

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It is generally agreed by all research workers that an unspecific positive Wassermann reaction is present in a number of women during pregnancy, labor and puerperium. Hilgers, Hygiene Institute, Koenigsberg, in a series of 6045 cases, found that the unspecific reactions showed first during the fifth month of gestation. A positive reaction was obtained in 2 per cent of cases during this month. It increased to 3.4 per cent in the sixth, 3.8 per cent in the seventh and 6 per cent in the eighth month. A decrease to 4.7 per cent showed in the ninth month. There was a marked increase to 6.2 per cent at the end of the gestation period. During labor the unspecific reaction was at its highest, running to 8.5 per cent.

Poeck,* University of Koenigsberg, went a step further in this work. Since the highest unspecific positive reaction was obtained during labor, he thought that it would be interesting to obtain data on the reaction in uncomplicated cases during the stage of abortion. He found that, while in normal pregnancy there was hardly ever an unspecific reaction in the first four months, in women aborting during this period the positive Wassermann ran as high as 7.6 per cent. These patients did not show clinically nor give any history of a luetic condition existing at any time prior to becoming pregnant. Moreover, all these cases were followed by two blood tests postabortum with negative results. Heretofore it has been customary to consider every case luetic that gave a positive Wassermann during abortion.

The results of tests made from blood taken during labor proved very interesting. The blood was obtained in the first and second stages of labor, during the height of pains and between pains, also postpartum. Unspecific reactions were found by Poeck in 19 out of 164 cases examined. The largest number of positive reactions showed when the blood was procured during the height of pain and at the expulsion period of the second stage. Out of this series of cases only two positive reactions were found in the first stage of labor. The number of positive reactions diminished during the puerperal state. Errors of laboratory technic were eliminated in every possible manner by having all tests made by the same serologist and under absolutely similar conditions.

In view of the fact that unspecific Wassermann reactions are obtained most frequently when blood for the tests is taken during the pains both in abortion and in labor at full term, it would seem reasonable to assume that the pains, per se, have some direct or indirect bearing on the unspecific reactions found in these cases. The key to the unspecificity of the reaction may lie in this observation.

According to Poeck, the positive reaction drops to 4.2 per cent during the puerperium. He does not consider the findings during this stage as a hang-over from the period of pregnancy and labor just gone through but entirely independent of it. Unspecific reactions were found as late as three weeks postpartum. This author also feels that he is justified to draw the conclusion from these findings that a woman during the gestation period, labor and puerperium is more apt to give a definite reaction in case of existing syphilis.

CONCLUSIONS

1. A positive Wassermann in the first four months of pregnancy is very likely due to a luetic condition.

2. Beginning with the fifth month of gestation, and particularly during labor, a definite diagnosis of syphilis is not justified on the strength of a positive reaction. Without a previous history or clinical manifestations of the disease it is advisable to wait until after three weeks postpartum, when additional tests could safely be made to corroborate or disprove the first findings.

3. The result of systemic changes brought about in a pregnant woman acts as a stimulus in bringing about a positive reaction in case of existing lues. This stimulus can, in a sense, be compared or considered the same as a provocative dose of salvarsan.

4. A positive reaction obtained during abortion need not necessarily denote syphilis.

It is no small matter for one at any time, and especially a woman during these trying days, to be told of a disease of such severe nature to be existing. The mental shock may result in serious consequences or complications at the time or months later. And then to find that this was all uncalled for is, to say the least, dreadfully disappointing. It is hoped that the warning given here will save a few women unnecessary grief and the attending physician a great deal of annoyance.

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* Poeck, Ernst Zentralb. f. Gynaek, No. 40, October, 1927.

PEDICLED SKIN GRAFTS *

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By the use of pedunculated skin grafts results can be attained which are not possible by other means. The present paper is given with the idea of showing the underlying principles and the possibilities of pedicled skin grafts; but on another occasion I hope to have the opportunity of presenting a series of cases showing the end-results.

By pedicled skin grafts is meant a graft which, when moved to a new location, is still attached to its blood supply. This is a simple pedicled graft. When skin is freed from its bed and not allowed to reattach itself, it tends to heal by curling upon itself, and thereby forms a tube. This being nature's method of healing, it was conceived to suture the edges together in the beginning, allow the blood supply to develop, and use this tube to carry the graft. When one end of this tube is freed and the skin of a part or all of the tube itself used to cover a denuded area, we have the pedicled tube graft.

If, however, instead of using this tube, a portion of free skin is cut beyond the attachment and carried to the new position, we have a pedicled flap. Essentially, a tube graft and a tube flap are the same, the tube being the means whereby the skin to be grafted is carried from one location to another, while still attached to its source of nourishment. The tube flap can be carried a greater distance than is the case when the tube itself is used as the graft. However, the two types are frequently combined. When two tubes such as just described are made so that they lie end-to-end, leaving an untubed portion between, we have a double tube flap. This term is also applied to two flaps moved simultaneously to line and cover a cavity, as the mouth. Each of these types may be used to special advantage in selected cases.

A caterpillar graft is the designation applied when it is desired to use skin that cannot be moved the full distance at one jump. In other words, the caterpillar graft is tubed and one end is detached and sutured to a more desirable location. This is allowed to heal, when the other end is detached and sutured into the desired location or into a more convenient location. This process may be repeated several times before the graft arrives at a location where it can be used advantageously. Obviously, caterpillar grafts are not used as frequently as are the other types, and are used especially when skin of a particular type or texture is required.

The technic of preparing a pedicled skin graft or a pedicled skin flap is as follows:

The area to be covered is measured as to length and width. A skin area is then selected, from which the graft can be turned into the lesion without acutely kinking the pedicle, attention being paid to the thickness, color, texture of the skin, and the presence or absence of hair. Parallel incisions are then made in the selected area, a little more than the required distance apart, through the skin and subcutaneous fat to the underlying tissues. A pedicled graft which is no deeper than the true skin had better not be used, as it is then safer to use a free graft. The skin, together with its subcutaneous fat between these two incisions, is then raised and freed from its bed, but remains attached at both ends. The edges of the raised skin are then sutured carefully and accurately together so that there may be primary union with the least possible amount of scar formation.

The importance of bringing the edges into exact apposition cannot be overemphasized. By bringing the edges into exact apposition instead of approximating them, the amount of scar tissue which results from healing is minimized and the amount of scarred edges, which later must be removed, is thereby reduced.

The skin beyond the edges of the graft is then undercut so that it may be closed accurately under the skin previously sutured. Silkworm sutures tied over buttons, wrong side down, may be used to relieve tension. Special care must be taken to get accurate apposition of the skin at both ends of the incision, especially at the junctions of the flap to the body. The accurate closure of all edges is important, as the introduction of sepsis into the length of the tube is thereby lessened. The skin to be grafted into the lesion must obviously be free from infection, otherwise the flap may be lost or at best the new scar of union will be disfiguring.

At the end of ten to fourteen days, when it is desired to move the skin to its new location, the lesion is carefully prepared, special attention being given to the removal of all scar tissue. The flap is then cut free at its distal end and properly shaped without kinking the pedicle, and sutured very carefully to its new bed. When the pedicle itself is used as the graft, it must be opened, all scars excised, and the skin carefully sutured into its new

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

location. The care which is taken to suture the edges together prognosticates the appearance of the end result.

When gaps are left between stitches, large scars result. Do not approximate wound edges. Place them in exact apposition. The union of the graft to the surrounding skin must be accurate, edge to edge without tension and with a dressing of sufficient pressure to gently but firmly hold the graft to its bed. Stitches should be removed early, beginning usually at the end of forty-eight or seventy-two hours, removing every other one or two out of three, more or less, as may be indicated. Sutures are placed for the purpose of holding tissues in position until healing has taken place. When this is accomplished the sutures should come out. Early removal of sutures prevents cross marking. Care is necessary in removing them so that the edges be not traumatized.

Often times it is best to place the free end of the graft in one portion of the lesion, allow this to heal, then disconnect the other end and suture it into the remainder of the lesion. The second portion then really becomes a caterpillar graft.

For some purposes it is preferable to cut the skin to pattern, raise it from its bed, leaving the pedicle attached, and then suture it back into the place from which it was just raised. At the end of two weeks the flap may be moved with less likelihood of losing it than if it had been moved at once.

A double pedicled flap, cut across the top of the head from ear to ear and tubed on each side, may be used to provide skin covering for the bearded region of the face with very gratifying results.

To attain the best results the use of finer instruments than those used in ordinary surgery is imperative. Needles should be the finest obtainable, and suture material small, preferably horsehair. Avoid making a flap that contains a scar or other blemish, as these may interfere with the blood supply or mar an otherwise good result.

In the handling and suturing of the graft and its pedicle, it is important that the tissues be treated kindly, as any trauma invites infection. Infection means interference with the blood supply, and often the loss of the flap. Further, infection means heavy scars in the flap which must be excised before the flap can be used. The excision of this scar tissue may render the flap inadequate.

Every scar is the tombstone of a trauma. Tissues, therefore, must not be crushed by forceps or otherwise. Sharp hooks and painstaking work, without haste, minimize scars.

One of the most important points in the preparation of a pedicled flap or graft is to provide adequate nourishment. The blood vessels do not run in the skin but are in the subcutaneous tissue and fat beneath. It is, therefore, necessary in cutting the pedicled graft to include sufficient fat to insure the necessary blood vessels. When it is possible to do so, a branch of an artery should be included. In the so-called arterial flap, the pedicle consists almost exclusively of an artery and vein. This type of pedicle is drawn through a subcutaneous tunnel or it may be imbedded in a new incision.

It is important, also, that provision be made against venous congestion. Often times a flap which is adequate in every way becomes lost because of an overabundance of arterial blood being continuously supplied the part without the proper means of egress having been provided. This results in congestion. This congestion, however, may be prevented and relieved.

When a flap is dark and overfilled with blood immediately after or during the operation, it may be relieved temporarily by gentle pressure. If this is unsuccessful, puncturing the surface judiciously with a fine needle should be tried, and then with gentle pressure, allowing the blood to escape. Congestion must be prevented from recurring by applying pressure sufficient to control the influx of arterial blood. It is important, therefore, to use pressure in dressing these wounds. Pressure may be applied by the use of gauze pads, sea sponges, or rubber sponges applied with bandages or adhesive plaster.

It is important to remember that it is not advisable to complete a tube graft operation entirely at one sitting. In fact, this seldom should be done. A flap can be tubed and moved at the same time, but it is safer to allow time for the blood supply to become sufficient to carry it when one attachment is severed. This requires an interval of at least ten days. Haste may be fatal to the result. A time must elapse between steps, if best results are to be obtained.

Before beginning a skin grafting procedure it is advisable to obtain photographs and wax or plaster casts of the condition, so that the procedures to be carried out may be studied leisurely and the best decided upon. Photographs and casts should be obtained also after the work is completed. These are important as records. I have more difficulty in obtaining photographs of the finished result than of the condition previous to operation. At the completion the scars though small are red, and, therefore, I prefer to wait a month or more after the case is compelted before taking the finished picture. Patients faithfully promise to come back and many times do not.

The advantages of stage operations are being realized more and more by surgeons doing all types of surgery, and the necessity of repeated general anesthetics is one reason for this method not being more popular than it is. Stage operations under local anesthesia are accomplished with the greatest success and with minimum risk to the patient, as often two short operations under local anesthesia are preferable to attempting to do the work in one stage at a longer operation.

The greatest features of stage pedicled skin grafting are more certain viability of the tissues, the larger masses of tissues that can be moved, and the greater improvement in function, and, therefore, better cosmetic results.

Local anesthesia can be used in almost every operation. By preceding the operation about thirty minutes with a hypodermic of morphine and atropine the patient is quiet and there is no discomfort. Recent investigations have shown that by preceding the local anesthesia by a small dose of a member of the barbital group, relatively enormous doses of procaine (novocaine) can be given without deleterious effects. I have found that a small dose of amytal improves the anesthetic effects of the novocaine. Small children, of course, require a general anesthetic. Only under local anesthesia can the work be done deliberately and with the best results. Under local anesthesia I have operated on patients as young as four years and as old as eighty. Talking to the patients while operating and allowing them to answer tends to keep their minds off what is being done.

All dead spaces must be closed, as skin will not grow over dead spaces. Attempts to do this result in sloughs which, inviting suppuration, heal as a scar. During healing there must be no movement between the apposed surfaces, else large scars result, or healing does not take place.

It is frequently desirable when using a pedicled graft to line the under surface of the graft with skin or mucous membrane. This may be done by using a pedicled or a free graft which must be applied accurately, taut, and dressed with pressure. I once used the mucous membrane from the prepuce after circumcision to line a defect in the mouth. This mucous membrane and skin are readily obtained and should be used more often than they are.

Whenever a free full-thickness graft, a Wolfe graft, is used, the grafted area, after healing takes place, has a more or less yellowish appearance which is unsightly. A pedicled graft is not subject to this objection, as it retains its normal color, appearance and texture.

Probably the greatest importance to the individual of the pedicled graft is in industrial surgery, for here it is important to save members, where possible. Often at first appearance it might seem that the indications are to do an amputation. This may often be avoided by the use of a pedicled graft in one of its many forms.

An amputation gets the patient out of the hospital in a few days and a healed wound in about two weeks. A skin graft means a longer period in the hospital, more work for the surgeon, but a better result for the patient and a saving of members.

Pedicled skin grafts may be advantageously employed in the treatment of degloved fingers, hands, toes, etc. By degloved is meant the removal of the skin more or less as one would remove a glove. These members can be reconstructed by the application of pedicled flaps to one surface and then completing the covering when the first part is healed. The details of each case must be planned on the basis of the condition present. Burns and other lesions may be treated in the same way.

It is not always that areas from which skin is taken must be Thiersch-grafted, as the opened pedicle often can be made to cover the entire raw area, and when the wounds are carefully closed these scars are practically unseen. Furthermore, the conspicuous yellowish color which results from a free graft is obviated. In my experience the advantage is entirely on the side of the pedicled graft.

One of the most interesting modifications of a pedicled graft is that of zigzagging binding scars. In zigzagging, the scar tissue is excised and the joint mobilized. Incisions are then made laterally, the flaps raised and sutured in such a position that when healing has taken place the scar is no longer a line but contains two or more V's, placed in such a manner that extension is allowed. This method can be used advantageously in some cases of contraction deformities of the fingers, and the results are very good.

An important use of the Indian, Italian and French pedicled grafts is in the building of noses. In fact, it was to the rebuilding of the nose that plastic surgery owes its origin.

In the Indian method the flap is taken from the forehead and on a twisted pedicle is sutured into position. In the French method the flaps are taken from nearby and placed in the proper position. In the Italian method the flap is taken from the arm or some other distant part. Any flap used to reconstruct a nose, no matter from where it is taken, must be lined with epithelium, or else there will not result a suitable nose.

Many times the moving of skin to cover a defect is but one step in the procedures, as often it is of the greatest importance to do preliminary work. The removal of nearby scars, the building up of the underlying tissues, or the placing of preparatory substances such as cartilage may be necessary.

In this paper it has been my aim to point out a method of dealing with lesions which has been overlooked by the general surgeon, and if I have but called to your attention the possibilities of this ages-old procedure, when applied by modern technic, my aim will be satisfied. The illustrations were selected with the idea of showing methods and many slides had to be eliminated because of the space required.

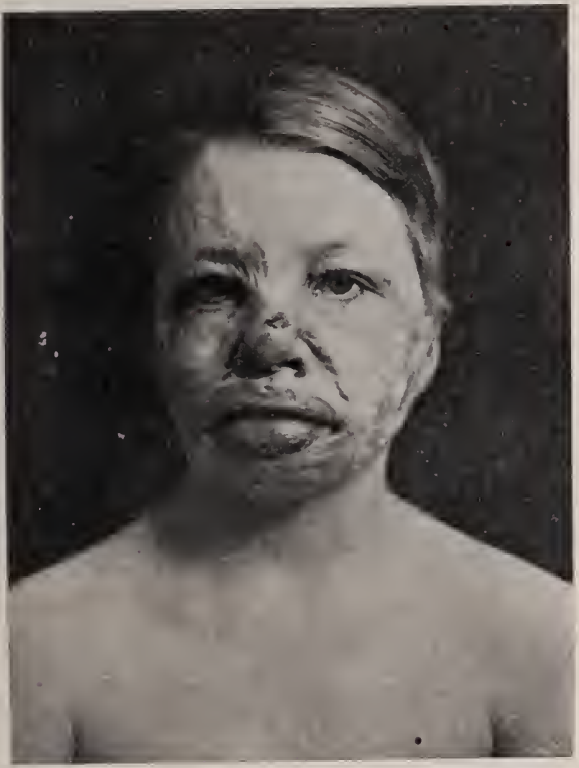

Fig. 1.

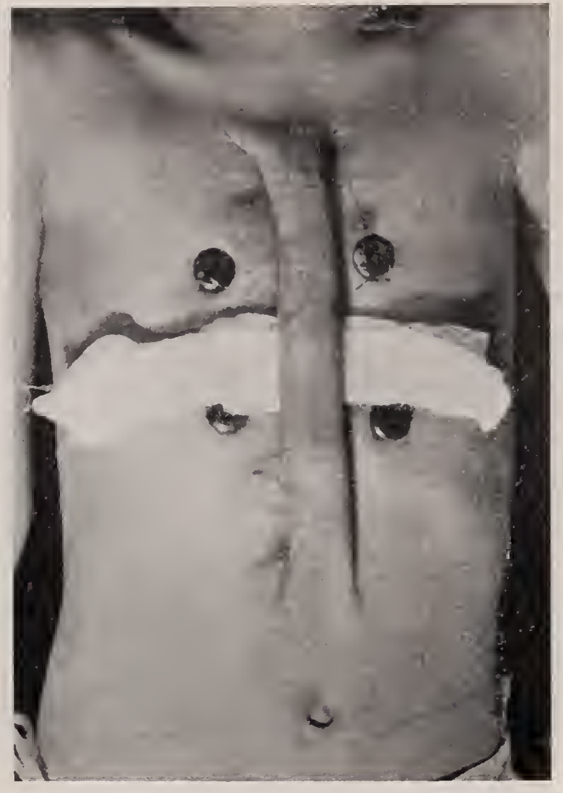

Fig. 2.

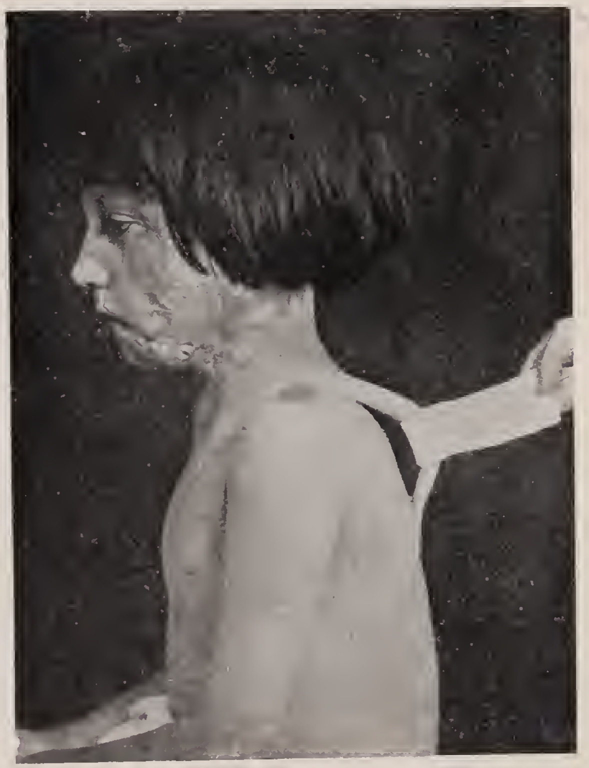

Fig. 3.

Fig. 1 shows a type of case that can be markedly improved by a pedicled skin graft. This was a gasoline burn.

Fig. 2 shows the pedicle cut and sutured into a tube. The skin of the chest has been sutured together beneath. All sutures have been removed ex-

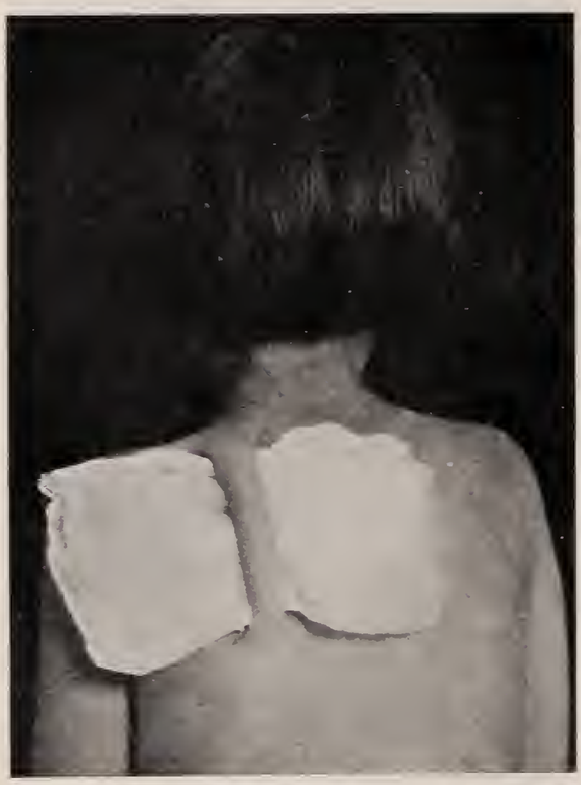

Fig. 4.

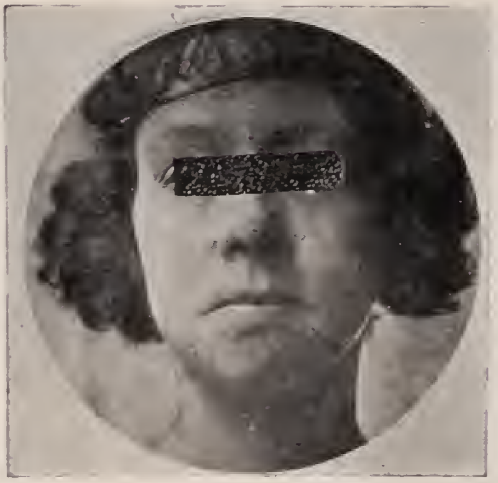

Fig. 5.

cept the sutures which were tied over inverted buttons. Later the tube was freed at its lower extremity, to be turned into the face.

Fig. 3 shows another case of the type benefited by pedicled grafts. This tube was taken from the back, the lower end being severed and turned into the face near the lip. When this is united, the upper end will be transferred to the face, anterior to the ear.

Fig. 4 shows the flap on the back after it had been tubed and before its removal.

Figs. 5 and 6 show the scar of the face extending from just below the right ear, around the chin and mouth to include the left ear. The scar from the angles of the mouth to the nasal labial angles have

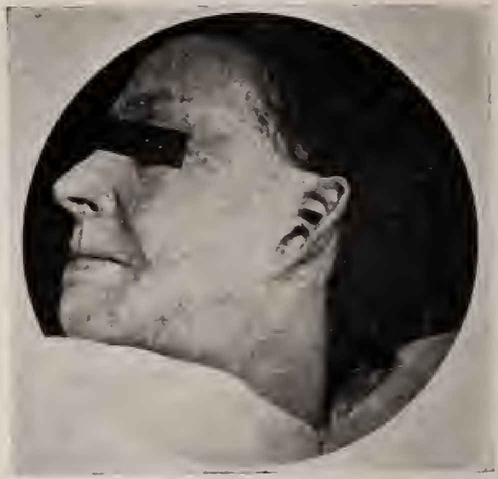

Fig. 6.

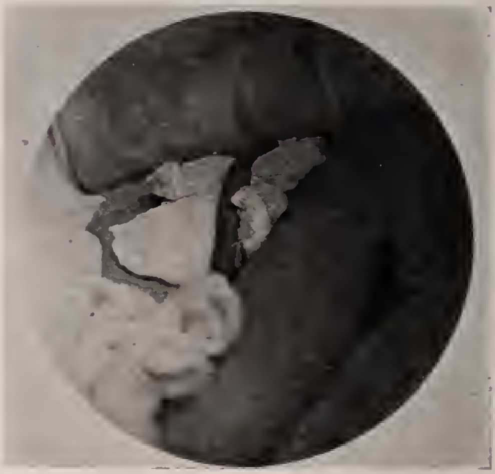

Fig. 7.

been removed and the skin sutured together, the scar being so small as to be imperceptible. The scars on the cheeks were especially conspicuous because the area had been Reverden-grafted, leaving small circular areas of skin surrounded by areas of scar tissue which on the face are very disfiguring. Reverden grafts had better not be used on the face.

Fig. 7 shows the pedicled graft cut from the chest near the axilla and ready to be sutured into the face.

Fig. 8 shows the pedicled graft sutured into the left side of the face and the skin which had been on the face pedicled and sutured into the ear. Later, the pedicle was severed from the chest and sutured onto the chin and right side of the face. The result was very good.

Fig. 9 shows the condition of a soldier who was injured in France during the war. He developed a carcinoma of the lower lip which was widely excised, including the glands of the neck on both sides. This figure shows the condition when he first presented himself for restorative measures. The mouth was higher on the right side than on the left and there was a large scar on the right side of his face above the corner of the mouth. The right angle of the mouth was wide and fixed. The red portion of his lip was very broad on the right half and none was to be seen on the left half. Disfiguring scars radiated in all directions from his lip. His lower lip

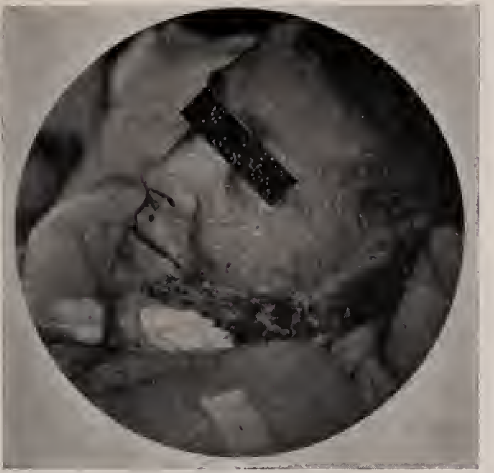

Fig. 8.

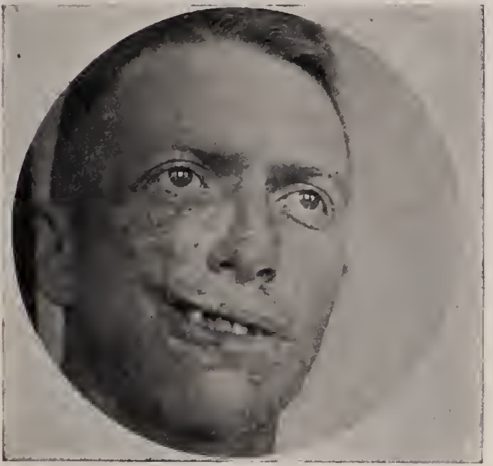

Fig. 9.

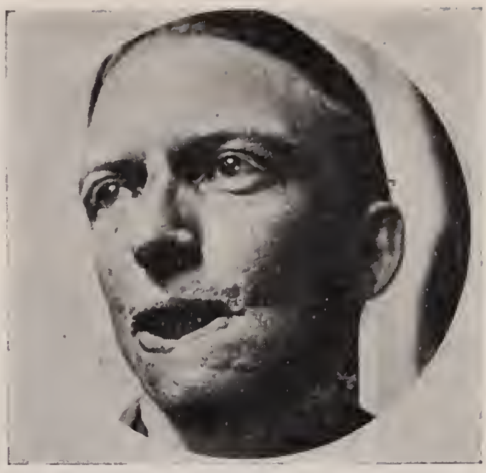

Fig. 10.

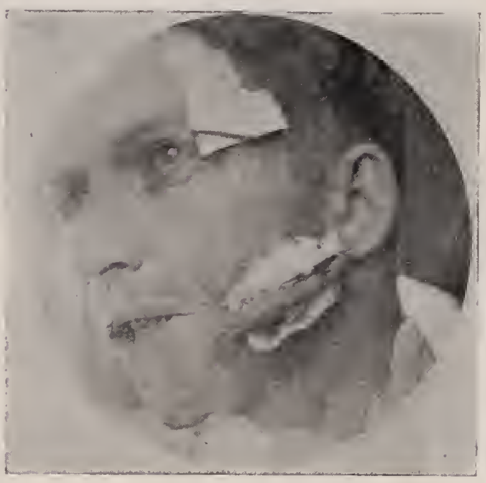

Fig. 11.

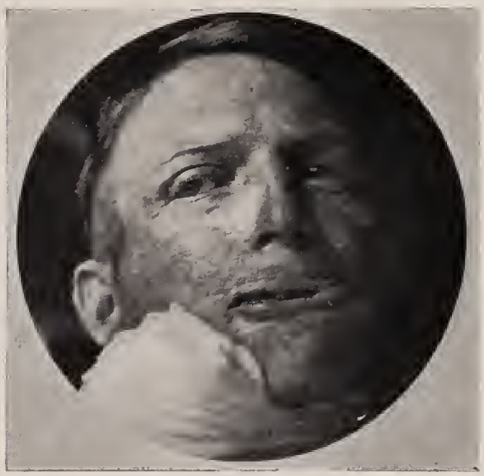

Fig. 12.

as seen at this time had been reconstructed from tissues from the cheek.

The first work that I did consisted in bringing the right corner of his mouth down level with the left by loosening it and putting in a graft above, correcting the contour of the corner of the mouth, transferring a portion of the red border of the right half of the lip to the left half and removing the scars from the chin. His lip was firmly attached to his lower jaw at the tooth margin, rendering it impossible for him to separate his lip from his teeth. The tissues adherent to the lower jaw were separated and the patient was circumcised. The mucous membrane thus obtained was sutured into this cavity by means of a stent. The result was very good.

Fig. 10. The lower lip being short did not allow the teeth to be covered and gave the patient a peculiar animal-like appearance.

The following operations were delayed to about one and one-half years after the original operation.

Fig. 11. Two incisions were made from just below the left corner of the mouth to the lobe of the ear, about one inch apart, through the skin and subcutaneous tissue. This strip of skin was lifted from its bed and with the ends still attached, the edges were sutured together longitudinally, making what the patient later called "a handle on the beer mug." The skin of the face was carefully and accurately sutured together. On the tenth day following this the ear end of the flap was severed. The vermillion border of the right side of the lip was separated from the skin and turned up and the opened flap sutured into the lip deficiency. The right half of the

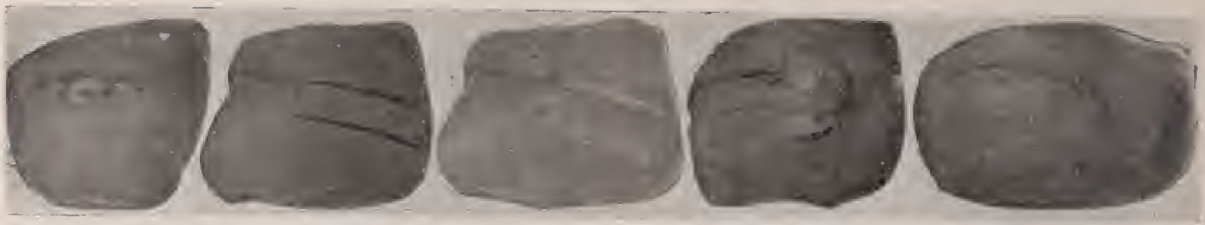

Fig. 13.

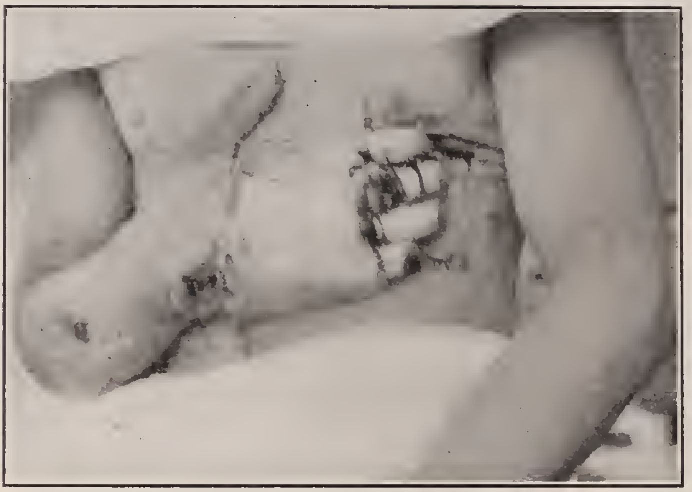

Fig. 14.

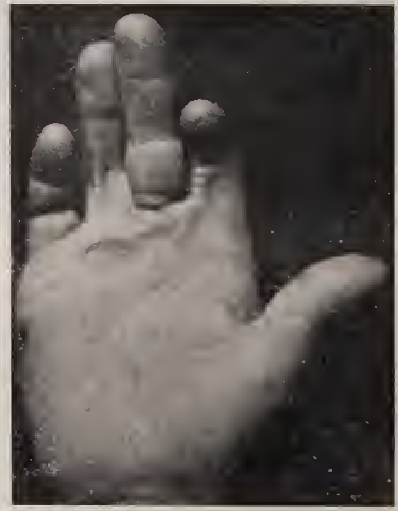

Fig. 15.

lower lip was then sutured to the upper lip. At the end of ten days the sutures were all removed and the remainder of the tube sutured into the left half of the lower lip. The pedicle was removed also at this time. The wound healed by first intention and the condition was much improved.

It would then have been necessary to have adjusted the corners, but before doing this the patient was allowed to go home to have some dental work done on his three prominent teeth. During his absence, about two years after the original operation, he developed a recurrence of his carcinoma in the glands of the right side of the neck and, therefore, no further work was done. Fig. 12 shows the result at that time. Fig. 13 shows the steps of the operation.

Fig. 14 shows method of saving a denuded hand from becoming stiff and useless by grafting it under a flap of skin of the upper abdomen, which resulted in a useful hand. The skin above and below was severed at the end of two weeks.

Fig. 15 is the hand of a boy who was badly burned on both palms. All scars were excised widely so as to give complete extension. A Wolfe graft was then placed in the palm with pressure and the skin of the index finger lengthened by zigzagging the scar. To do this an incision was cut diagonally from the long incision toward the base of the finger on each side. The flaps were then freed and the point of each flap was pulled across into the incision on the opposite side, giving two V's. The result was all that could be desired.

Fig. 16 shows an extensive burn of the chest and arm which had been repeatedly operated on. At the time I saw the young man he could raise his arm to something over a right angle. The heavy binding scar was excised and the scar zigzagged, as explained in the previous figure with the result that he can now raise his arm straight above his head.

Figs. 17 to 20, inclusive, give the following history: In 1898 there was a small hard spot on the left

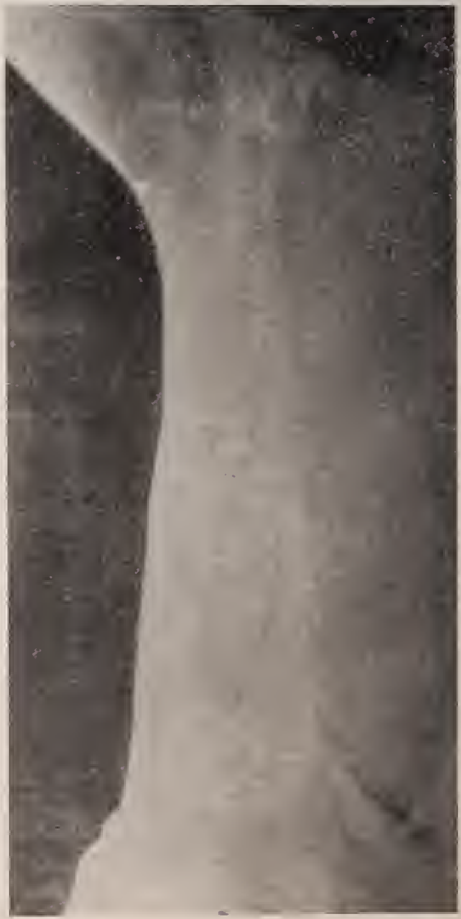

Fig. 16.

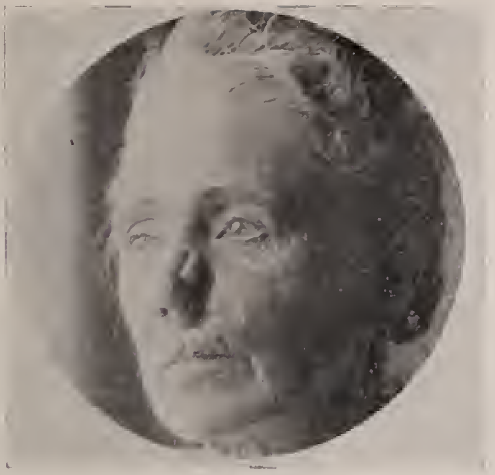

Fig. 17.

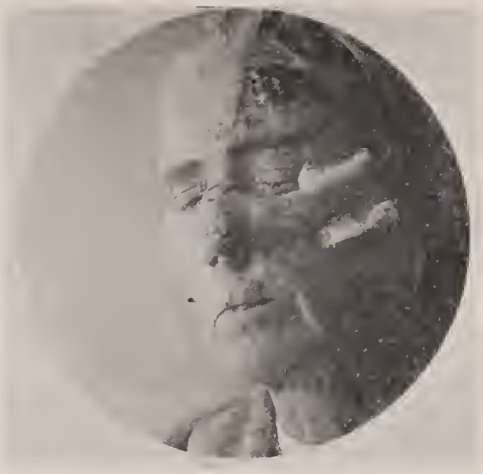

Fig. 19.

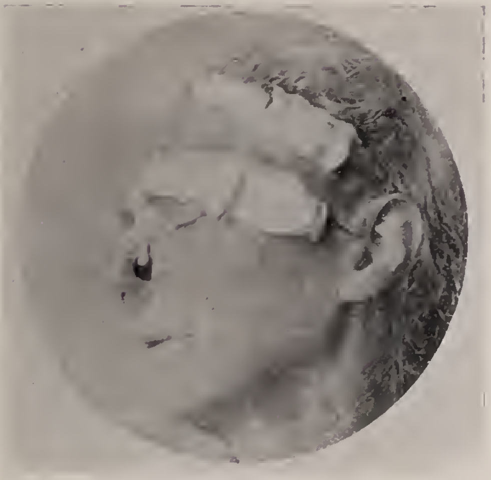

Fig. 18.

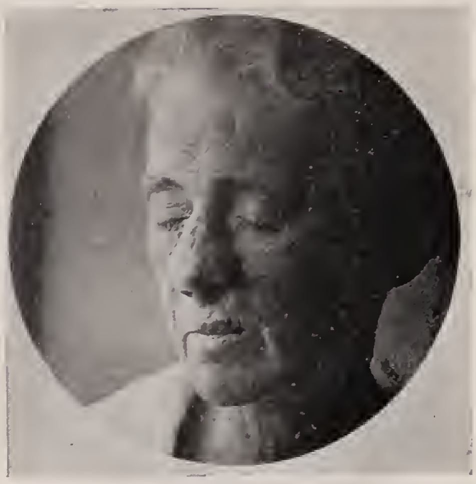

Fig. 20.

ala that could be felt but not easily be seen. This was incised but nothing removed and the growth continued to enlarge.

In 1906, twenty x-ray treatments were given without result. My later difficulties were probably due to these treatments. Carbon dioxide snow was also applied several times but without result, except that the mass became somewhat smooth but continued to enlarge.

In 1912, three operations were performed for the removal of the mass which was at that time very large. The nose had begun to shrink up.

In 1916, massage was tried.

From 1917 to 1921 faith cure was tried.

From 1921 to 1923 homeopathy was used and also violet ray, which was followed by a small slough. "Ultrablue" was also used, followed by sixty-five Abram's treatments. During this time the growth grew rapidly. Following this a skin specialist injected fibrolysin and the patient estimates that a hundred and fifty of these injections were given.

In 1924 a slough resulted which included the ala and a portion of the upper lip. The lip mass was cauterized and a plastic repair attempted.

Early in 1926 an attempt had been made to close the ala with a forehead flap. The condition the first time I saw the patient in June, 1926, was as shown in fig. 17. There was a loss of the left ala, the result of a condition which had been diagnosed as a keloid. She had had restoration attempted and had a scar from the glabella down along the upper portion of the bridge of the nose. A section of skin from the forehead was grown to the sides of the nose and was curled upon itself sidewise and lengthwise. The lip was too short. An attempt had been made to lengthen it. The vermillion border was turned up and had a chronic painful area at the tip. There was a large mass of this so-called keloid material under the skin and covering the left malar bone.

It will be noted in the cuts that in the work which I did no more scars were made except in the forehead. By incision through an old scar the skin and other tissue of the left side over the malar bone were raised and a large mass of hard, dense, white tissue was removed, the mass being about one-half the size of a small egg. This was later diagnosed as an embryonal cartilaginous tumor.

An attempt was made to close the ala by using the flap previously cut as a covering, the lining being made from the surrounding tissue. This not being successful, an attempt was made to use this pedicle flap for the lining and to use the skin of the cheek for the outer lining, by the French method. This attempt was also unsuccessful as, due to the many x-ray treatments previously given, the tissues did not heal and separated when the stitches were removed as though they never had been united, although good, broad, raw areas had been brought together.

It having been found that nearby tissues would not heal properly, tissues from a distance had to be used. Two parallel incisions were made in the forehead about two inches apart, extending from the temple close to the ear up to, but not including, the scar made when the previous operator had attempted to close the lesion with a flap from the forehead. This flap was raised from its bed, still attached at both ends, and sutured into a tube for its outer one-half to two-thirds. This flap was cut in such a manner as to include the temple artery. The inner portion of the graft was lined with a free flap of skin taken from the inner side of the right arm (fig. 18).

At the end of two weeks the skin and scar tissue on the nose was excised very widely so as to be sure to be well beyond the x-rayed skin on all sides. The forehead flap was then severed from its medial attachment and a clamp put on the pulsating vessel. The arm skin which was used to line the flap was then cut to the size and shape of the nose defect. This lining flap was then sutured accurately to the margin of the defect. Working in this small space, it was necessary to leave the stitches long and untied until all had been inserted. After these stitches had been tied, the end of the skin flap was sutured accurately into the skin defect of the nose as shown in fig. 19.

At the end of two weeks the pedicle of the flap which was now attached at its medial end to the nose was severed, leaving sufficient skin attached to the nose to assure a good ala. The vessel at this time had to be clamped again. The cheek surface was then freshened and the outer edge sutured as accurately as possible in this position. The flap was then returned to the forehead which defect it filled completely and was accurately sutured into place.

The patient was then sent home and, when she returned about two months later, the new ala was pulled down and the twist in the columna straightened. The patient now has a very good nose and requires only the removal of the x-ray treated skin from the upper lip with the correction of the remaining defect to give her a real good nose (fig. 20).

Fig. 21 shows an ear, the cochlear portion of which had been severed by a tree falling on the patient in the woods. There was an irregular jagged scar at the upper portion. At the first operation the incision was made above and below this scar which was excised, and that part of the cartilage which was rolled under and back was straightened out. Not only was the scar removed, but the new scar, which is practically invisible, was placed in a more advantageous position.

When healing had taken place, a double incision was made in the neck from above the ear lobe downward and united at the bottom. This flap of skin was raised from its bed and the skin back of the ear was also raised from the head. The flap of skin from below was then turned up, while yet attached, into the pocket above, and was carefully placed in position so that it would extend well forward to the ear, as far back as possible and as high as possible, and was sutured in this position. It was then dressed with pressure.

At the end of about two weeks incision was made through the overlying skin, releasing the skin lining flap and the free edges were accurately sutured in exact apposition. The skin back of the ear was undercut and the denuded area made as small as possible with tension sutures. The raw area was covered with a Thiersch graft under pressure of a wax model. The healing of all wounds was very good and the skin grafted area has taken on a normal appearance (fig. 22). Later the notch at the junction of the cochlea and lobe was removed by careful suturing, and the contour otherwise improved by inserting thin slices of ear cartilage which were removed from the back of the lobe. The final shaping of the cochlea is yet to be done, but as it is, the ear is very presentable.

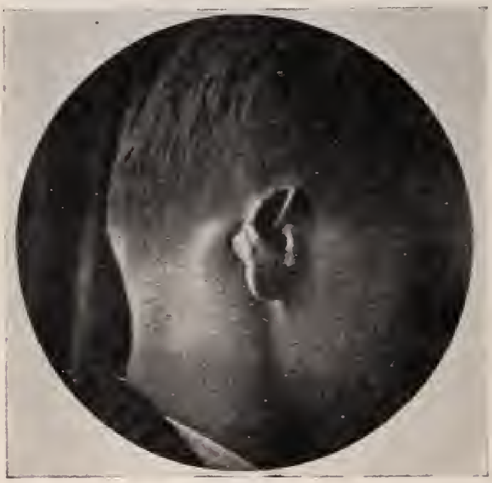

Fig. 21.

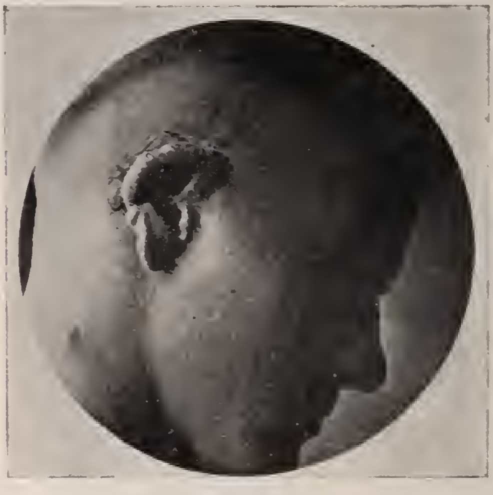

Fig. 22.

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THE MANAGEMENT OF PATIENTS WITH HEART DISEASE [*]

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In considering the subject of the management of "heart cases" one asks (1) what is generally understood by the term "heart cases," (2) what are the symptoms and signs of heart failure, (3) what are "heart attacks," (4) do all heart cases require the same management, (5) can heart failure be recognized early, so as to prevent progressive damage, (6) what are cardinal principles of treatment of patients with mild, moderate and severe heart disease?

I suppose the general conception of the heart case is variable as is the term heart failure. To one, heart cases are those with obvious failure or broken compensation, while to another, potential factors leading sooner or later to outspoken failure depicts the picture of a heart case; to another, there may be in the history of rheumatic fever and evidence of mitral stenosis some doubt as to the degree of heart damage and the necessary treatment. There are certain symptoms and signs of heart disease which may be unreliable, as noted by Reid,[1] being present in patients with or without heart disease.[†]

So, too, so-called heart attacks may have no association with heart disease, as pointed out by Sprague.[2][‡]

In studying about one thousand records of patients with heart disease I found the following incidence of early signs and symptoms:

PERCENTAGE INCIDENCE OF SYMPTOMS AND SIGNS IN EARLY HEART FAILURE. VARIOUS ETIOLOGY

	Percentage
Dyspnea	70.1
Palpitation	62.6
Heart pain	36.2
Digestive disturbance	24.2
Respiratory symptoms and signs	22.6
Weakness	19.9
Dizziness	34.4
Heart enlarged	57.3
Liver enlarged	19.2
Edema	17.7
Extra systoles	43.5

Heart failure should have a broader meaning than that of outspoken broken compensation, including the earliest evidence of muscle weakness. Since patients with heart disease vary in the severity of their symptoms, it is well to orient ourselves, when considering treatment, with such a classification as that of the American Heart Association,† which classifies patients with organic heart disease as to the degree of failure or as to the functional capacity of the heart.

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[*] Read before Southwestern Idaho Medical Association, Boise, Ida., Oct. 26, 1927.

[†] Reliable and unreliable signs of Reid are as follows:

Rule of age. Under 40 do not make diagnosis of heart disease unless there are present one or more of: Chief reliable signs.

1. Distinct overdistension of neck veins.
2. Unmistakable friction rub.
3. Precordial thrill.
4. Diastolic murmur at apex or base.
5. Irregular rhythm persisting after exercise, especially if 120 or more.
6. Definite signs of enlargement of the heart.
7. Wide-spread arterial disease or persistent blood pressure of 160 or over in the young and 180 or over in the elderly.

Minimal symptoms and signs.
  Angina. No signs per se; worse with exertion; relief from vasodilators.
  Lessened tolerance:
    Elderly: heart disease until proved otherwise.
    Young: without enlargement or mitral stenosis.
      Aortic disease or fibrillation may not be due to the heart but to tuberculosis or pyogenic infection.
  Electrocardiograph: abnormal conduction, aberrant QRS, if not from drugs.
  Systolic murmurs at the apex in febrile conditions suggest endocarditis.
  Septic heart disease: subacute bacterial endocarditis.

Unreliable symptoms and signs.
  Palpitation, pain, dyspnea, dizziness, fainting, exhaustion, fatigue, cardiorespiratory murmurs, pulmonic murmurs, extra systoles with no heart disease, weak sounds, reduplications, accentuated pulmonic second sound and blue, cold hands.

[‡] A. Attacks of cardiac origin.

1. In which palpitation is the presenting symptom. The patient is conscious of cardiac activity, fast or slow, constant or intermittent, painful or merely annoying.
    - a. Extra systoles; cause sensations of pounding in the chest or even severe pain in susceptible individuals.
    - b. Paroxysmal auricular tachycardia, the frequent cause of true attacks of palpitation; often alarming.
    - c. Paroxysmal auricular fibrillation; occurs frequently in hyperthyroidism and as a precursor of permanent fibrillation usually in patients with rheumatic or arteriosclerotic heart disease, though may occur rarely in healthy young people.
    - d. Paroxysmal auricular flutter; is rare, occurring in elderly people.
2. Attacks of pain, precordial or substernal.
    - a. Angina pectoris; history more significant than physical findings: relation to exertion, emotion.
    - b. Coronary occlusion; often called acute indigestion, the "heart attack" in its severest form.
3. Attacks in which respiratory symptoms are uppermost.
    - a. Paroxysmal dyspnea or orthopnea, occurring in the progress of congestive heart failure in hypertensive or syphilitic heart disease; may be the earliest evidence of myocardial failure.
    - b. Pulmonary edema; much like the former but with abundant frothy sputum.
    - c. Hemoptysis; a rather rare symptom occurring in mitral stenosis and hypertension.
    - d. Cheyne-Stokes respiration; may occur in paroxysms, awakening the patient in great apprehension.
4. Paroxysmal cyanosis.
5. Cerebral effects prominent.
    - a. Stokes-Adams syndrome; symptoms referred to the head and not to the heart.
    - b. Cerebral embolism may be considered a heart attack in a broad sense because of the direct connection to cardiac pathology.

B. Attacks of noncardiac origin.

1. Respiratory origin.
    - a. Pulmonary embolus; may be confused with coronary blocking or cerebral embolism with heart disease.
    - b. Spontaneous pneumothorax; sudden chest pain, cyanosis; dyspnea; collapse and distant heart sounds may suggest heart attack.
    - c. Asthma of the anphylactic type.
2. Cerebral origin.
    - a. Fainting; rare in organic heart disease.
    - b. Cerebral vascular spasm.
    - c. Epilepsy.
    - d. Labyrinthine disease.
3. Nervous origin.
    - a. Effort syndrome.
    - b. Hysteria.
4. Miscellaneous.
    - a. Shock.
    - b. Ether or operative death.

In order to discuss the treatment of patients with heart disease satisfactorily we must consider not only the degree of heart failure present but what are the most common forms of heart disease, which I have found to be as follows:

COMMON TYPES OF HEART DISEASE

1. Hypertensive cardiovascular disease ("cardio-renal").
2. Endocarditis.
    a. Chronic valvular disease.
    b. Subacute bacterial endocarditis.
    c. Malignant endocarditis.
    d. Acute rheumatic fever.
3. Goiter.
4. Angina.
    a. Hypertensive.
    b. Coronary thrombosis.
5. Disturbances in rate and rhythm (often an entity).
    a. Auricular fibrillation and flutter.
        Paroxysmal.
        Established.
    b. Extra systoles.
    c. Paroxysmal tachycardia.
    d. Bradycardia.
        Heart block.
6. Irritable heart.

Not only is it necessary to consider the above but most satisfactory results will be obtained, if one has a clear picture of etiologic factors, structural damage, pathologic physiology on some such basis as that of the nomenclature of Cardiac Clinics of the American Heart Association.‡

THE GENERAL MANAGEMENT OF HEART FAILURE

While treatment of symptoms is at times to be deplored, in heart failure they frequently are so troublesome that they demand attention, and are even diagnostic. Attacks of sudden, severe precordial pain, attended with heart failure, and followed by fever, leucocytosis and pericarditis give the diagnosis of coronary thrombosis with infarction, but moderate pain only upon exertion is not the immediate emergency of the former and requires different treatment. The pain is what the patient wants relief from and he is not particularly interested in why he has it or whether his blood pressure is high or arteries thickened.

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† Degree of failure; functional capacity.

Class 1. Patients with organic heart disease, but able to carry on ordinary physical activity.

Class 2. Patients with organic heart disease, but unable to carry on ordinary physical activity (cardiac insufficiency).
    a. Activity slightly limited.
    b. Activity greatly limited.

Class 3. Patients with organic heart disease, but unable to carry on any physical activity, i.e., who must remain in bed or chair (cardiac insufficiency).

‡ Classification of Heart Disease. Nomenclature of Cardiac Clinics.

A, ETIOLOGY

1. Unknown.
2. "Rheumatic."
    a. Acute rheumatic fever.
    b. Chorea.
    c. Growing pains.
    d. Tonsilitis.
    e. Pharyngitis.
    f. Others, as purpura, erythema nodosum, etc.
3. Syphilitic.*
4. Bacterial.* Specify if possible.
5. Thyroid.*
6. Toxic.
    a. Bacterial.
    b. Mineral.
    c. Vegetable, specify if possible.
7. Neurogenic.
8. General systemic disease. Specify the disease, e.g., general sclerosis, chronic nephritis, diabetes, etc.
9. Traumatic.

* In each of these conditions it should be noted if the etiologic factor is still active or inactive, e.g., active syphilis, aortitis with dilaton, aneurysm of the aorta, etc.

B, STRUCTURE

1. Atrophy of heart.*
2. Enlargement of heart.*
3. Cardiac infarction.*
4. Rupture of heart*
5. Cardiac thrombosis.
    a. Auricle.
    b. Ventricle.
6. Myocarditis, acute.
7. Myocarditis, chronic fibrous.
8. Fatty infiltration.*
9. Fatty degeneration.*
10. Tumor of heart.
11. Endocarditis.
    a. Acute.
    b. Chronic.
12. Cardiac valvular disease.
13. a. Aortic insufficiency.
    b. Aortic stenosis.
    c. Mitral insufficiency.
    d. Mitral stenosis.
    e. Pulmonary stenosis.
    f. Tricuspid stenosis.
13. Congenital abnormalities.
14. Pericarditis.
    a. Acute.
    b. Fibrinous.
    c. With effusion.
    d. Serous, purulent.
16. Adherent pericardium.
    a. Hydropericardium.
    b. Hemopericardium.
    c. Pneumopericardium.
17. Tumor of pericardium.
18. Aortitis.
    a. Without dilation.
19. Aneurism, specify.
20. Embolism, specify.
21. Thrombosis, specify.
22. Arteriosclerosis, general.
23. Arteriosclerosis, locality.
24. Arteritis, specify.
25. Periarteritis, specify.
26. No circulatory disease.
27. No cardiac disease.
28. Undiagnosed.

* While these diagnoses may be made clinically they generally necessitate autopsy.

C, PATHOLOGIC PHYSIOLOGY

1. Regular sinus rhythm.
2. Vagal arrhythmia.
    a. Sinus arrhythmia.
    b. Sinoauricular block.
    c. Simple bradycardia.
    d. Ventricular escape.
3. Premature contractions.
    a. Auricular.
    b. Nodal.
    c. Ventricular.
4. Simple tachycardia, sinus—not paroxysmal.
5. Paroxysmal tachycardia.
    a. Auricular.
    b. Nodal.
    c. Ventricular.
6. Auricular flutter.
    a. Paroxysmal.
    b. Chronic.
7. Auricular fibrillation.
    a. Paroxysmal.
    b. Chronic.
8. Auriculoventricular block.
    a. Partial.
        1. Prolonged conduction time.
        2. Dropped beats.
    b. Complete block.
9. Intraventricular block.
10. Neurocirculatory asthenia.
11. Valvular incompetency.
    a. Mitral insufficiency.
    b. Tricuspid insufficiency.
    c. Pulmonic insufficiency.
    d. Aortic insufficiency.
12. Hypertension.

Patients with dyspnea suggest problems in diagnosis, but they are grateful if the dyspnea is relieved. Some patients complain only of digestive disturbances, or in certain instances acute pain in the abdomen suggests surgical possibilities, when the real cause is in a congested liver, coronary thrombosis or in infarct in the spleen. Others have a troublesome cough; probably bloody sputum has suggested primary pulmonary disease, but careful examination shows congestive heart failure to be incipient. The relief of the patient, then, should be the first aim of therapy, but I claim that the best therapist is he who has the broadest knowledge of all possibilities contributing to the phenomena of symptoms and signs.

For convenience of discussion it will be well to consider the degree of failure present, according to the classification already mentioned:

A, COMPENSATING HEART CASES (CLASS I)

These patients are potential heart cases whether or not the etiologic factors be of the common types already referred to. If the patient is middle-aged, has moderate or marked hypertension and evidence of mild involvement of the kidneys, it may be months before any symptoms of cardiac embarrassment supervene. These should be kept in mind, however, and as pointed out, the early symptoms and signs may be recognized in their beginning and progress stayed.

It may be that after moderate exercise noticeable dyspnea is present or that the heart rate remains fast. The liver may enlarge before other signs are obvious or, upon listening over the pulmonary bases posteriorly, showers of fine rales are heard, though there may be no cough or sputum. The treatment is one of conservation or prevention, including restriction of activities, care as to diet, avoidance of constipation, etc. Carefully regulated exercise is a good heart tonic.

Chronic valvular disease may not impair the heart but is a potential source of danger. These patients usually have a decreased cardiac reserve. A simple test is one of exercise, and there is none better than hopping twenty times on each foot. The person with good reserve will show a moderate acceleration of heart rate and some increase in respiratory rate, but within three minutes the rate is back to normal. The heart of such a patient may be enlarged, but this is from work hypertrophy, nature's safety measure, and in itself beneficial rather than otherwise. General supervision of activities, moderate exercise, etc., constitute treatment.

In *goiter,* though there may be tachycardia for months, there may be little evidence of heart failure. Even when auricular fibrillation is present, there may be little evidence of heart failure, though sooner or later it appears.

In *angina* of mild degree the patient may be very slightly restricted in his activities, i.e., whether the condition be of long standing and not progressive, or whether there is a definite history pointing to coronary thrombosis, from which he has recovered. his activities are restricted, though under ordinary circumstances he is comfortable.

Of the *disturbances in rate and rhythm, auricular fibrillation* is most common. Patients with this condition may have no restriction in their activities, though if they are tested for cardiac reserve, it is found to be below normal. The etiologic factors may be of significance and have some bearing upon the treatment. These are:

1. Hypertensive cardiovascular disease.
2. Chronic valvular heart disease.
3. Goiter.
4. Infections; syphilis, scarlet fever, diphtheria, influenza.

Patients with fibrillation may at times show mild evidences of heart strain, controlled easily by rest and digitalis. If hypertension is a factor, treatment should be directed toward its control. *Extra systoles* may be sufficient to cause symptoms, but as a rule activities are not impaired. If they are associated with evidence of heart failure they may indicate a straining heart.

Paroxysmal tachycardia may cause no restriction in activity, merely indicating an irritable heart. If it occurs in healthy people, so far as can be determined, and if the attacks are not of increasing frequency, simple sedatives, correction of digestive difficulties and removal of focal infections, with the administration of quinine to depress excitability of the heart, may be found entirely effective. If the patient is seen in an attack, reassurance, a dose of bromides or the use of an enema, if constipation is a factor, may be effective. Pressure on the vagi may stop the attack at once.

Bradycardia may be vagal and not impair activity.

Heart block may not cause restrictions of activities. In such cases a diagnosis as to etiology should be made. If syphilis is a factor, it should be treated.

The *irritable heart* may cause no restriction in usual activities. The diagnosis should be made only after careful study.

B, MANAGEMENT OF BROKEN COMPENSATION (CLASSES II AND III)

The presenting symptoms in this group vary; one may have extreme dyspnea with very little edema, while another has extensive edema. Another will have much digestive distress, while yet another has troublesome cough or bloody expectoration as the chief complaint.

The *general principles* of treatment in these cases may be tabulated as follows:

a. Rest.
b. Depletion.
c. Stimulation.
d. Suitable diet.
e. Regulation of mode of life.

Rest is important to reduce the work of the heart and may be necessary, in the way of sleep, for the comfort of the patient. The patient who has struggled through a period of wakefulness from general discomfort or orthopnea may show wonderful improvement, if he has a good night secured by means of a hypnotic or sedative. Bromides, chloral hydrate, luminal, morphine or opium should be used to relieve distress and secure sleep. Exertion should be reduced to a minimum, even to the point of restriction as to going to the toilet. Elderly people, however, complain of weakness if kept too long in bed.

Depletion is of great value if edema is present. Purgation is to be controlled according to the degree of edema. Magnesium sulphate may be used every morning. Calomel may be used occasionally. Catharsis should be watery in order to relieve edema. Niemeyer's pill, containing calomel, squills and powdered digitalis, is often valuable. An old prescription contains powdered jalap and elaterine.

Christian[3] is of the opinion that diuretics in edema of cardiac origin are more effective and less tiring than cathartic drugs. Digitalis is effective through its action upon renal circulation and is not diuretic except in cardiac edema.[4] Theocin, grains VII s.s., three times a day, stopping one day, he finds more effective than theobromine or caffein, the latter being objectionable because of its effect upon the nervous system, producing sleeplessness, excitement and nervousness, though it improves the pulse and stimulates the respiratory center. Often it relieves Cheyne-Stokes breathing. Diuretin is often effective but occasionally patients are wakeful from it. Euphyllin is often remarkable in its diuretic effect. Novasural[5] is, as a rule, not effective in cardiac edema and its harmful effect upon the kidneys should be borne in mind. Observations in Multnomah County Hospital and in private practice, however, show it to be valuable in some extreme cases, even though the kidneys may be impaired.

Venesection is a valuable adjunct in depletion, often neglected, especially when there is evidence of right heart failure, as shown by marked cyanosis and venous stasis, associated with engorged neck veins, enlarged liver, pulmonary congestion or pulmonary edema.

Restrictions of fluids. Fluid should be restricted to three pints in twenty-four hours with one pint as the minimum. Paracentesis should be resorted to when fluid in the chest or abdomen is extensive enough to embarrass the heart or respiration.

Stimulation. Digitalis, of course is the agent *par excellence.* It is well to become familiar with one standardized preparation and to use it. Because of expense, some of the preparations of digitalis with special trade names may not be desirable. The standardized tincture costs about thirty cents an ounce, while digalen costs $1.25. In using the tincture one should be careful as to how the patient measures the drops, for medicine droppers vary greatly; we found that it took 40 to 60 drops from the ordinary medicine dropper to make 25 minims, accurately measured. It is well to order a minim graduate in dispensing the tincture. We are apt to use too little rather than too much.

While calculation according to body weight gives a sense of accuracy, it is sufficient to remember that the average patient in broken compensation requires 22 gr. of the standardized leaf or 225 minims (15 c.c.) of the tincture for full therapeutic effect, i.e., slowing of the pulse with decrease in the size of the dilated heart and relief from troublesome symptoms or 1 gm. leaf, 1 c.c. tincture or 10 c.c. infusion per ten pounds body weight. It is well to remember also that 1.5 c.c. is a daily maintenance dose, since digitalis is eliminated at the rate of 0.1-0.2 gm. in 24 hours. (To estimate the amount remaining in body subtract from total 0.150 gm. for each day since beginning of administration.)[7] It is well after giving the therapeutic amount to stop for twenty-four to forty-eight hours, using some other cardiac stimulant in the meantime if necessary; then digitalis may be resumed if decompensation is still present. Thus one may avoid the toxic effects of digitalis, the symptoms of which are anorexia, nausea, vomiting and the signs such as sinus arrhythmia, coupled beats, pulses alternans, auricular paroxysmal tachycardia and auricular fibrillation.

TREATMENT OTHER THAN DRUGS[8]

Diet. Patients with dyspnea and general discomfort do not wish food and the feeling of fullness and distress in the epigastrium often produces anorexia. The diet in general should be one that is easily digested. Smith's diet[9] is suitable for many.*

		Gm.	
BREAKFAST			
Milk		100	½ cup
Cream		66	¼ cup
Cereal (cooked)		120	½ cup
Sucrose		10	3 teaspoonfuls
Glucose		10	6 teaspoonfuls
Dextrin-maltose		10	0
DINNER			
Soup	Cream	132	½ cup
	Potato	50	¼ cup
	Butter	100	2 teaspoonfuls
Ice Cream		100	½ cup
or Junket**			½ cup
Milk		100	½ cup
Water		100	½ cup
or Crushed Ice		100	1 cup
SUPPER			
Soup	Cream	66	¼ cup
	Milk	100	½ cup
	Spinach***	50	¼ cup
Butter		10	2 teaspoonfuls
Custard	Egg	50	1 egg
	Milk	100	½ cup
	Lactose	10	3 teaspoonfuls
	Glucose	10	3 teaspoonfuls
LUNCHES			
9 a.m.			
Water		100	½ cup
or Crushed Ice		100	1 cup
10 a.m.			
Orange Juice		150	¾ cup
Lemon Juice		5	1 teaspoonful
Sucrose		10	3 teaspoonfuls
Glucose		20	6 teaspoonfuls
3 p.m.			
Milk		100	½ cup
Cream		66	¼ cup
Flavoring			
Dextrin-maltose		12	4 teaspoonfuls
Sucrose		5	1 teaspoonful
4 p.m.			
Water		100	½ cup
or Crushed Ice		100	1 cup
7 p.m.			
Milk		150	¾ cup
Dextrin-maltose		10	3 teaspoonfuls
or Candy			1 stick

C, SPECIAL TREATMENT

Hypertensive cardiovascular disease may be associated with nephritis. Not infrequently, during a period of broken compensation it becomes a real problem, because of decreased output, large amounts of albumin and many casts. In this event one must regulate the treatment to save the kidneys as far as possible, which means low proteid and sodium chloride, watchfulness for uremic symptoms, etc. Kidney embarrassment may clear up after a rather acute exacerbation, the patient recovers from his heart failure and the kidney involvement so that he is comfortable for years. The salt-free diet of Allen is frequently helpful in these cases. The treatment of the heart failure is the same as already outlined. The basic or alkali-producing diet of Sansum is often helpful.

Chronic valvular disease may be the etiologic factor in the case of broken compensation. In these patients one should bear in mind the possibility of new endocarditic lesions, evidenced by changes in the valve sounds, murmur and rise in temperature. In these cases prolonged rest is necessary. Subacute bacterial endocarditis must be borne in mind in low grade, continued fever in patients with chronic valvular disease. The treatment of this condition is a chapter in itself.

Goiter, as it affects the heart is often unsuspected, particularly in elderly people with small adenomata. We have seen four such patients in the past year who developed acute thyrotoxicosis and heart failure, in whom the symptoms were at first obscure.

Angina, termed by Aschoff angina of effort and angina decubitus, in my experience is usually the former. The symptoms and signs have already been referred to. In mild cases the fullness or pressure in the precordial region on effort or after a hearty meal may be confusing as to diagnosis; in fact, the distress may be so definitely referred to the epigastrium that the patient is sure it is "indigestion" and wants relief for that. The relation to effort and relief with nitroglycerin often make the diagnosis clear. The acute pain, with heart failure, rise in temperature with leucocytosis and precordial friction complete the picture of coronary thrombosis, frequently called "acute indigestion."

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* The composition of the weighed diet (calculated) is protein, 44 gm.: carbohydrate, 220.6 gm.; fat, 109 gm., and calories, 2,076. Additions to the diet are made between the fourth and tenth day, beginning with toast, jelly, salt-free crackers and butter; sieved fruit and baked potato are included later. If the diet is first increased on the fourth day, the patient may be receiving as final additions to the basic diet protein, 3.7 gm.; carbohydrate, 112.3, gm.; fat, 25 gm., and calories, 718, as follows: breakfast, toast, 20 gm.; butter, 10 gm.; jelly, 20 gm.; dinner, baked potato, 1; sieved fruit juice, 100 gm.; toast 20 gm.; butter, 10 gm. Stick candy may be substituted anywhere in the diet for the equivalent amount of sugar.

** Milk, 100; cream, 66; sucrose, 5; dextrin-maltose, 10, and a half junket tablet. When junket is served, the milk at 7 p.m. is reduced to 100.

*** Pureed spinach. Other vegetables may be substituted.

The first group of mild cases seems to go through a subacute stage and with sufficient rest, regulated diet and occasional digitalis, recover so as to be comfortable under ordinary conditions for months or years. I have seen a hundred or more of this type in the past two years. Theobromine is often very effective in improving the coronary circulation and general condition. Nitroglycerin is safe for troublesome distress. In the acute cases the problem becomes one of safeguarding the heart in every possible way. This means absolute bed rest with help for the slightest change of position of the patient. The results are often most satisfactory. I have seen about twenty such acute cases in the past year and am often surprised with their excellent recovery.

Of the *disturbances in rate and rhythm,* in cases with broken compensation, the commonest are auricular fibrillation and extra systoles. The former may appear in the attack of failure in a heart formerly regular. The heart enlargement, due to dilatation, may be extreme and responds well to digitalis, so that in a few days the heart borders are almost normal and there is a remarkable improvement in the patient. Fibrillation due to goiter, however, does not respond so readily to ordinary medical methods, but, if toxicity of the goiter is obvious, surgery may restore the heart to normal rate and relieve the cardiac symptoms promptly.

Irregularity in broken compensation due to *extra systoles* indicates irritability of the heart due to fatigue. This may be controlled by the ordinary methods of treating the heart failure, though I have seen the condition apparently foretelling progressive damage to myocardium, followed later by paroxysms of tachycardia due to flutter or fibrillation and leading to permanent fibrillation. In people with heart disease extra systoles may portend progressive damage.

Bradycardia in the elderly or chronic valvular disease should suggest *heart block,* a serious disturbance in conduction. If heart failure is present, the prognosis is guarded, though recovery may occur, and the patient may be comparatively comfortable and ambulatory. Calcium lactate and barium chloride have recently been recommended in these cases.

CARDIAC EMERGENCIES

Our older ideas that patients with heart disease die suddenly have been modified. Many patients or their families are warned that sudden death may come because a heart murmur has been found. As a matter of fact most cardiac patients have progressive failure which may extend over a long period. The best guide to prognosis, aside from accurate etiologic, structural, pathologic and physiologic diagnosis, is the response to treatment. Frequently this response is discouragingly slow but there is final recovery. In other patients there is surprising recovery following careful and watchful treatment.

Certain cases show symptoms resulting from heart disease which come on acutely so that the physician is called hurriedly. The attack is found to be due to acute pulmonary edema, nocturnal dyspnea, coronary thrombosis (if abdominal symptoms are prominent, it is called "acute indigestion"), paroxysmal tachycardia, acute heart failure (also in pneumonia), syncope from Stokes-Adams disease or sudden onset of extra systoles. These have been already referred to under heart attacks[2] and under the discussion of broken compensation. The physician must be on the alert in the differential diagnosis.

Acute pulmonary edema is terrifying to patient and family and requires prompt treatment. Venesection, morphine and atropine or immediate stimulation may be life saving. If the blood pressure is high, nitroglycerine or amyl nitrite may be helpful. The outlook is grave and the patient should be kept in bed with proper treatment for days after the attack.

Nocturnal dyspnea is also an emergency at times. I have found this to be Cheyne-Stokes breathing in some instances.

"Aucte indigestion," "ptomaine poisoning" or "paralysis of the bowel" frequently have coronary thrombosis as the etiologic factor and demand most careful treatment. Acute abdominal symptoms may be due also to embolism in spleen, liver or mesenteric vessels. The following case is illustrative.

A man of 67 was seen in April, 1927, with heart failure from hypertensive cardiovascular disease. The heart was dilated and fibrillating. Under careful supervision he recovered so that he played eighteen holes of golf three times a week and attended to his business. One afternoon in October he had acute and constant abdominal pain with nausea and vomiting. When seen that evening the pain was constant and agonizing deep in the epigastrium but the heart was compensating well. There was no muscular rigidity and there was no fever. Twelve hours later he vomited blood. Mesenteric thrombosis was suspected but a surgical consultant thought the condition due to a perforated peptic ulcer. Operation showed thrombotic mesenteric vessels and the stomach wall was partly gangrenous.

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CLINICAL ASPECTS OF HYPERTENSION *

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The subject of high blood pressure and hypertension is interesting because it is complicated. There is, perhaps, no disease which has had such a thorough study in recent years which has yielded so little information as to the etiology and more especially to the cure of this ailment. Every phase of the problem has been worked on in detail. There are such terms as blood volume, blood viscosity, peripheral resistance, elasticity of the capillary walls, muscular contraction of the heart, all of which are very interesting but lacking in clinical application. It is with this thought in mind that it is proposed to work from backward forwards. In other words, a working classification of the different forms of hypertension is hereby presented, drawn from the clinical response to medical treatment. The symptoms and conclusions are made from a review of one hundred case histories, records of an office practice.

TYPES OF HYPERTENSION

Nervous type. This type is most frequently found in women, the complaint usually being dizzy spells, palpitation of the heart, restlessness, later on indigestion and flatulence. In many of these there are symptoms of a mild goiter. Others present the symptoms at the menopause. The pulse is rapid, from 100 to 150, the systolic blood pressure is not so very high but may reach 200 or more, usually from 160 to 180.

Diagnosis of this type can be made from the history, rapid pulse, increased patellar reflexes and nervous symptoms. The treatment of this type of hypertension is rest and sedatives. The sedatives employed are bromides, luminal or henbane derivatives as required. Treatment of this type is generally satisfactory.

Case 1. Mrs. ——, age 56, weight 95 lbs. Comlaint: She came to the city to do her shopping. On the bus she was seized with dizzy spells every five to ten minutes which caused her heart to palpitate. On walking the street she nearly fell over. She went home to rest, thinking perhaps that she would recover. The spells became worse and she returned for medical treatment.

Physical examination was negative to goiter or focal infection. Heart sounds, normal. Urine, normal. Patellar reflexes, markedly increased. Systolic blood pressure 150, diastolic 80, pulse rate 104. Hemoglobin (Dare) 80. For a patient weighing 95 pounds, she was considered a case of hypertension.

She was given elixir lupulin and bromides comp., dr. 1, four times a day. The prescription was refilled once. At the end of one month her blood pressure readings were 130-80, pulse rate 86. Patient feels fine, has had no dizzy spells or palpitation after the first week of treatment.

This case illustrates a mild type of nervous hypertension. The usual cases are more severe and the treatment extends beyond this time. However, the symptoms, body weight, and response well illustrate points which I wish to present.

Peripheral resistance type. The associated symptoms may be quite varied, depending on which part of the vascular tree is most affected. Rheumatic pains, pressure headaches, insomnia, dizzy spells, precordial pain or the sense of an impending stroke may be the symptoms complained of.

The diagnosis of this type can be made by Hertzel's test. By binding both feet and one arm, the systolic pressure is increased by fifty points or more. In a normal person there would not be over 5 mm. of Hg. rise. This test is not recommended, however, and may prove dangerous. Diagnosis can be made by the general aspect and appearance of the patient. Tightened arteries, a high systolic pressure from 200 to 300 with a constantly high diastolic pressure of 100 or over. The pulse rate is but slightly increased and may be normal.

Treatment. Iodides seem to benefit. Good clinical results can be obtained from the intravenous injection of sodium iodide, sodium salicylate and colchicine. In my series this ampoule was more efficacious than sodium iodide alone. The injections are given at three to five day intervals. If the high pressure is still sustained, an occasionally intravenous injection of sodium cacodylate, gr. VII, seems to benefit the progress, sodium cacodylate in large doses being given only when kidney function was normal. Iodides were also used in other forms and prescriptions for the convenience of the patient, but results were less satisfactory.

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* Read before Clatsop County Medical Society, Astoria, Ore., Nov. 10, 1927.

Case 2. Mr. ——, age 58, weight 196 pounds, came in complaining of numbness of the left side of the body, affecting the left side of the neck, left arm and leg. The numbness was quite severe, causing a dull ache in his left shoulder and hip. To all appearances this patient was about to have an apoplectic stroke. Systolic pressure was 210, diastolic 120, pulse rate of 80.

He was immediately ordered to bed. Saline laxatives and blood pressure tablets were given. After five or six days, treatment of sodium iodide, sodium salicylate and colchicine intravenously was instituted. Five intravenous injections were given. There was no change and an intravenous of sodium cacodylate, gr. VII, was given. After this there was improvement. Two months later two readings of blood pressure showed systolic pressures of 160-110 and 160-100, pulse rate of 80. His numbness has practically left him except for a dull pain in left shoulder and hip which is slight. Patient is at work again.

Cardiac type. This type is made with reservations, depending on further laboratory proof, should this ever be possible. It is a type of hypertension which is evidently due to an overfunctioning power of the heart. It does not appear to be associated with nervousness, peripheral resistance or toxemia. Diagnosis is made by therapeutic test. This classification is here made from deduction and analogy. It is noticed that hyperthyroidism is due to an overactive thyroid gland, hyperacidity due to an oversecreting stomach. Why should the heart go by unsuspected? It is a difficult thing to prove, but who knows but what the heart may need restriction as well as any other part of the body. Anyway, it appears so clinically.

We have noticed several cases of hypertension, in which the nitrites, iodides, bromides and other medicines have failed to reduce high blood pressure. In these cases, if small doses of the ext. belladonna, gr. 1/10 or 1/5, are given three or four times a day, the pressure will come down and the patient be relieved symptomatically. The conclusion in these cases is that the heart must have been overactive as belladonna in small doses lessens the output of the organ.

When used in the cardiac type of hypertension, I have always given belladonna in a pill form, combined with a grain of sodium nitrite. There are several such pills on the market, known as high blood pressure tablets, arteriosclerosis tablets, etc. The main ingredient is belladonna which decreases the output of the heart. If sodium nitrite is used alone, there is no reduction of blood pressure.

Toxic type. This is a type of hypertension in which some poison or focus of infection seems to be the responsible agent. The cause may be alcoholism, syphilis, puerperal eclampsia, focal infection of the teeth, tonsils, appendix, gallbladder, prostate, etc. The symptoms of this type are quite varied and dependent on the etiologic factor present. There seems to be more of a tendency to nephritis and secondary anemia in these cases. The treatment is to remove the cause, if this can be done. Symptomatic treatment for the anemia, specific for lues and surgery when indicated.

SUMMARY

There may be a combination of two or more types in the same individuals. A nervous type of hypertension may be associated with a peripheral resistance type. A peripheral resistance type may be connected with a toxic type, etc. In these cases combination treatment is indicated. A great deal can be accomplished by the careful study of each individual case.

Rest in bed and relaxation from work benefits all types of pressure. For a dangerous symptom, such as cardiac pain or the sense of an impending stroke, a thorough purging with a saline laxative and rest in bed are imperative. Venesection may be indicated. After the immediate danger is over, treatment may be instituted according to the type of blood pressure present. The patient should be under observation for a period not less than six months to one year. The length of time required to treat a case successfully depends upon the severity of the case and the complications which arise. On the whole, treatment along the lines indicated has proven quite satisfactory.

Upper Gastro-intestinal Disease Associated with Syphilis. Twenty-three patients with syphilis, gastric symptoms and evidence of pathologic organic changes were studied by H. L. Bockus and Joseph Bank, Philadelphia (*Journal A. M. A.*, Jan. 21, 1928). Six of them presented the accepted clinical criteria necessary to the diagnosis of gastroduodenal syphilis. In seven other instances, the syphilitic factor probably played some part in the clinical picture presented. In the remaining ten cases, the presence of syphilis was only an incidental factor. In eleven of the twenty-three cases, improvement resulted from antisyphilitic treatment. Neoarsphenamine was directly responsible in eight cases. In one of these cured cases, recovery resulted from a course of potassium bismuth tartrate. Three patients died during a course of antisyphilitic therapy. Arsphenamine was being administered in two of these cases. Another fatal termination ensued during a course of intravenous iodides. In spite of this arsphenamine is still the drug of choice in the treatment of selected cases of gastrointestinal syphilis. Iodides and mercury were inferior to either neoarsphenamine or bismuth.

THE COMMON TRAUMATIC DERANGEMENTS OF THE KNEE JOINT[*]

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TACOMA, WASH.

(It was my good fortune in May of 1924 to attend a symposium upon "Internal Knee Derangements" at the annual convocation of the British Orthopedic Association in London. In accordance with a British custom, the knee joint and this alone was the subject of discussion for the session. The outstanding feature in the discussion by England's most eminent orthopedic fraternity was the utter truthfulness of the members in acknowledging their frequent errors of differential diagnosis. It was really encouraging to workers who were so often baffled with their own knee derangements to learn of the collapse of a brilliant working diagnosis, upon exploration of a knee, in the workshop of a Jones, a Fairbanks, an Elmslee or a Dunn. The symposium brought out many important and vital new points. This article has been written as a resume of the author's opinion as modified by recent English opinion.)

The human knee joint has long been a closed book. The term "internal knee derangement" is a particularly fortunate one because of its latitude. The experienced clinician dislikes very much to venture a single diagnosis following a trauma of a part, so I find it a fact that even yet the keenest orthopedic observers seem loath to render a positive opinion upon the knee joint prior to an exploratory venture into this oddly elusive structure. And this, just as we thought it to be true that certain fixed symptoms in the knee did point toward definite entities.

The knee joint is subject to unusual strains and injuries. As in many other joints the simple traumatic inflamations are self-reparatory. Under proper care and rest those injuries fully recover and leave no permanent defects. This paper does not attempt to consider any of these conditions. On the other hand, there are a few very troublesome permanent defects due to violence that do not so automatically repair, and it is to a consideration of these residual conditions that I invite your attention.

KNEE MOVEMENTS

It might be well to briefly consider the normal knee movements. Fisher observed that the knee is not a true hinge joint, but enjoys in its excursions an additional gliding movement or, as Goodsir described it, "the movement of a wheel restrained by a drag" (brake).

Beside the hinge movement actively taking place by the bones on flexion and extension, Fisher explains much cause of pathology by plainly demonstrating that the semilunar cartilages are not stationary structures but that they both move slightly forward in full extension and slightly backward in full flexion.

The external semilunar moves back and forth as a whole, while of the internal semilunar only the anterior half moves and a well-marked kink occurs at the junction with the fixed posterior part. Further, in knee rotations each of the femoral condyles glides upon the head of the tibia and carries the semilunars forward and back with them.

This conception throws much light upon the automobile accidents to knees. The victims sitting with knees flexed and semilunars drawn backward are in position for all manner of tears and strains, when suddenly submitted to the accident of having the body-weight thrust upon them by the impact of the car against some unresisting object. Many present at the London conference insisted that knee injuries were rare, when the leg was fully or normally extended.

KNEE EXAMINATIONS

The English surgeons lay great stress upon adequate examinations of the knee. Sir George Humphrey is noted for this advice, "Eyes first and much, hands next but little, tongue not at all." To see Sir Robert Jones examine a knee is quite dramatic. He sits in front of his audience, the patient, and tells him like a mind-reader all his symptoms and complaints. Usually the audience has little to add except surprise. His is the "I-M-P" method. First he uses Inspection, then Movement and lastly Palpation.

It must be said, though it does seem needless, that every patient should be subjected to the same routine examination as any other general surgical case. The serologic and other findings are often extremely vital. Again, no knee joint should be considered as an entire entity.

Of primary importance in making the local examination of the knee is the taking of a "standard" radiogram. Each man has a different technic, but if he insists on cardinal positions of buttocks, knees, feet and relaxations in all of his cases, his pictures will read a great deal more to him. A lateral x-ray picture of a knee usually sheds less information not discoverable in the physical examination, but the anteroposterior view is usually more helpful in ruling out fractures, loose bodies and the like. It is a fact that much of the common viscus pathology does not show in radiograms. It is a pity that we have not a better technic for radiographing knees in the positions of weight-bearing, for much information is certainly lost in the pictures taken in the horizontal position of rest.

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[*] Read before North Pacific Surgical Association, Victoria, B. C., Dec. 3, 1927.

The x-ray picture should be studied for variations in the interoseous spaces, for lateral deviations, for tibial spine and other fractures, for loose bodies and all anomolies. But better than this the radiogram gives us intimate knowledge of the bony changes and metabolic states of the patient during the preceding months and years. Atrophies, hypertrophies, deforming ridges and plates, thinning and thickening of the cortex of long bones, chronic changes in the soft parts, fat pads and arteries are often engraved in a tell-tale manner of great assistance to the careful observer.

The knee examination room should be light and warm. Both legs should be bared and patient seated facing the examiner on a high table, with a platform upon which to stand for inspection. Measurements of both knees, thighs and calves are taken. Atrophy, swelling, rigidity, limitation of motion, enlarged bursae are noted.

In this connection I have found it well to attempt a decision by physical means as to the location of both the atrophy or the swelling. Is the swelling *capsular,* is it *periarticular,* is it *osseous?* In the atrophy is there an osseous change; do the ligamentous structures also contribute to the delinquency? All the voluntary motions and passive lateral motions are inquired into. With all muscles relaxed the forward and back play of the joint, indicating fore and aft stability, is tested and compared with the normal play in the mate. While the knee is being flexed to 90 degrees, the joint is palpated during the excursion of motion. Crepitus, gliding, areas of the arc productive of pain or restricted action are discovered. Care should be taken in testing the lateral stability of the knee, while holding the extended knee fixed at hip and ankle, that one is not deceived by knee flexion taken for lateral play. The patellar mobility is investigated.

Bristow lays considerable stress on the tenderness of the femoral attachment of the lateral ligaments rather than at the tibial attachments as an indication of lacerations and tears. Finally, the patient walks, raises on the toes and heels, pedograms for static defects of the feet are made, and other abnormalities ruled out.

CLASSIFICATION OF TRAUMATIC DEFECTS

Let us consider what traumatic pathology is rightfully classed as true internal derangements of the knee:

1. Torn, split, fractured, deformed, absent semilunars.
2. Injuries to any capsular structures.
3. Loose bodies of any character.
4. Mechanical irritations from enlarged bursae or fat pads.
5. Secondary changes from alterations in the contour of articulations, such as the fractures of the tibial spine and gross condylar fractures.
6. Rupture of the crucial ligaments.

What other pathology must we heed in a differential diagnosis? (a) Arthritis of all types, (b) muscular insufficiencies, (c) adhesions, (d) slipping tendons.

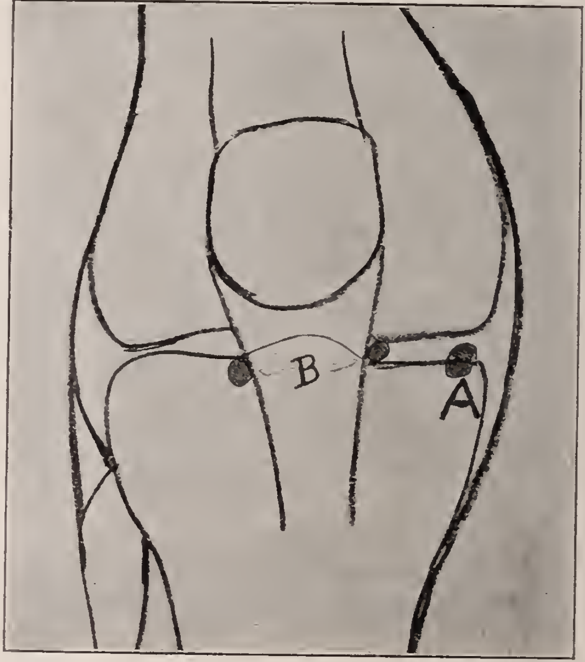

Fig. 1. Painful spots of a traumatized knee.

PAINFUL SPOTS AND AREAS OF THE KNEE

In the accompanying diagrams I wish to show graphically a few leading signs, all of which, while useful, are by no means infallible (fig. 1).

1. After traumatism, when the pain complained of is finely localized to one small definite spot covered with the end of the finger in the location of B, fig. 1, besides the patella at the level of the border of the tibia, we can be reasonably certain of tear somewhere in the anterior half of the semilunar cartilage on that side.

2. Finely localized pain, complained of in one spot, A, over the inner condyle and just anterior to the inner hamstrings, points toward dislocation, tear or maceration of the posterior horn or a circumferential tear of internal semilunar.

3. Generalized pain and soreness over a broad area of the joint on either side the knee is more indicative of strain or rupture of the capsular structures of the lateral ligament. Patient usually places

both hands about the knee and complains of misery over the articulation and its adnexa. Usually motion is painful but not much limited.

4. Acute protusion laterally about the interarticular spaces of the joint, and fluid, with later an increased tension in some of the bursae, are signs of acute infection.

5. Forward or back play of the tibia on the femur indicate capsular tears of great extent and rupture of the crucial ligaments.

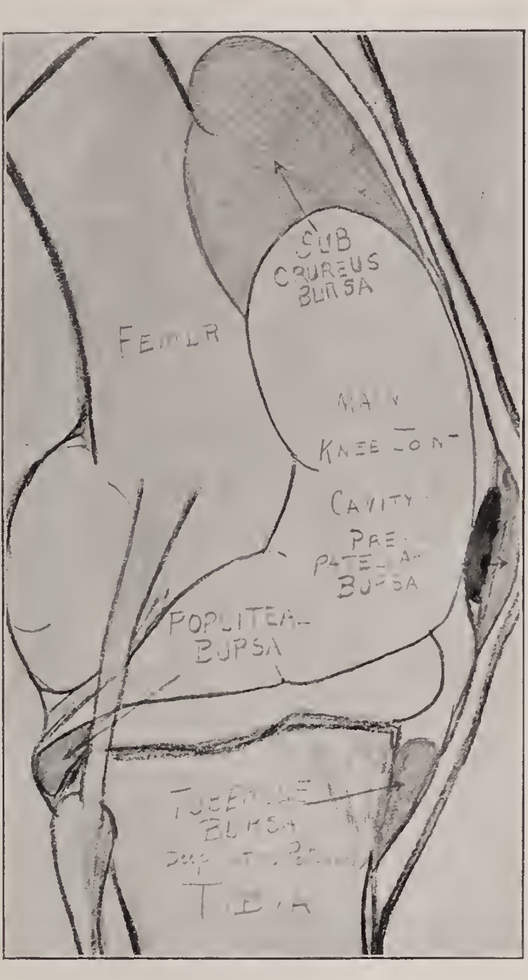

Fig. 2. Bursae of knee commonly involved in traumatic inflammations.

6. Popliteal bulging just above the gastrocnemius heads indicates mild synovial tension, accompanying the lighter strains and sprains.

7. Discrete bulbous enlargement at the sites of any one of the several bursae points to acute or chronic pathology in that bursa (fig. 2).

CAUSATIVE FORCES

At the London conference Bristow successfully held the following ground regarding the external forces producing three knee injuries.

1. *Forced rotation, with the knee bent, causes the cartilage injuries.*

2. *Force applied to the outer side of the leg, when the foot is on the ground, causes injury to the internal lateral ligament and to fat pads.*

3. *Hyperextension of the knee causes injury to the anterior crucial.*

SEMILUNAR ACCIDENTS

Any accident that forces or throws undue strain upon a flexed knee may so rotate the joint into abduction or adduction as to both tear the lateral ligaments and produce any one of the many common fractures of the semilunar cartilages. In this country the automobile shocks with the passengers sitting are probably accountable for the frequency (fig. 3).

The surgeons of the British Isles enjoy a much greater familiarity with the knee joint than do we of America, because of the frequency of accidents to miners working in low seams of the mines. The fact of trauma in positions in which it is impossible to stand erect, together with the great frequency of knee injuries to persons riding in cars, call special attention to the relative dangers of knee derangements with the knee flexed rather than extended.

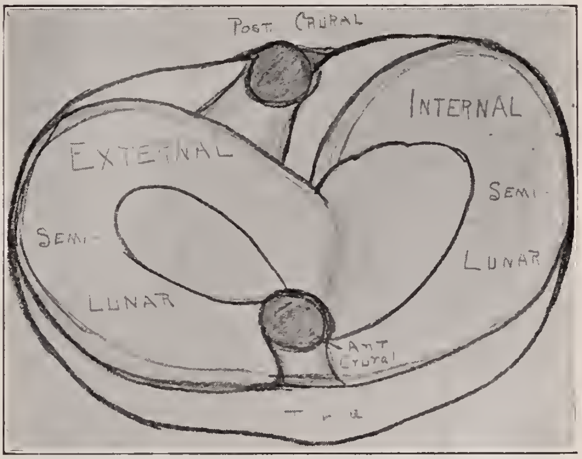

Fig. 3. Relations of the knee semilunar cartilages.

Some English surgeons make a great point of the atonicity of the muscles about the knee as predisposing factors in knee derangements. Others focus attention, more rightfully, on the bony shapes, weight-bearing mechanisms and ligamentous structures concerned, for our American experiences lead us to believe that the physically strong suffer these injuries as commonly as the weak.

There is little to add to the general knowledge of the knee joint. Bristow takes exception to the common belief that semilunar cartilage injuries are dependent upon their close relationships to the internal lateral ligament. He says "the internal lateral ligament has been regarded by many writers as the key structure viewed from the standpoint of function." Its intimate relationship to the internal semilunar cartilage has been insisted upon and has been accepted as the reason why this meniscus is damaged so much more frequently than the external. In a dissected specimen, a coronal section through the joint, certain points in connection with the ligament and its connection with the cartilage merit attention (fig. 4).

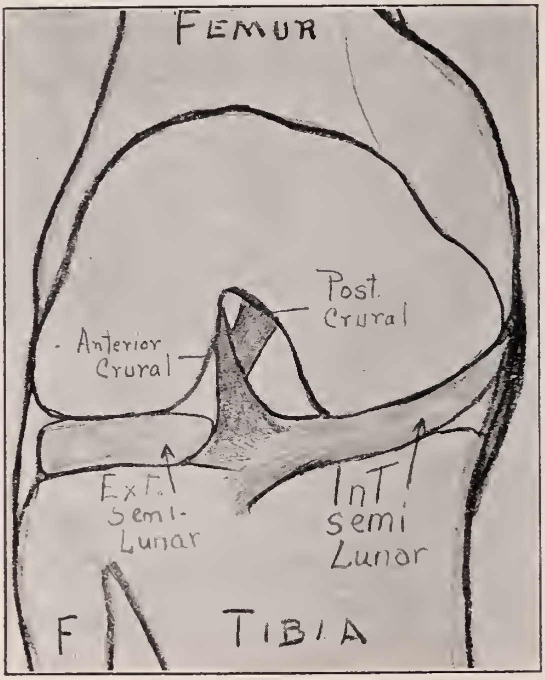

Fig. 4. Shows relation of knee semilunar cartilages to the capsular ligaments.

Contrary to the general accepted teaching, the internal lateral ligament is a comparatively feeble structure. Its so-called superficial layer is nothing more than the continuatioin over the inner aspect of the joint of the deep fascia which envelopes the thigh and leg. This fascial layer is joined by loose areolar tissue to the so-called deep layer of the ligament. The separation between the two layers is an easy matter and involves no cutting of fibres. The deep layer of the ligament is attached above the inner aspect of the femoral condyle, about one inch above the joint line. It is connected by definite bands which pass obliquqely downwards to be attached to the superior border of the internal semilunar cartilage, a slight though definite attachment. The ligament passes down over the inner aspect of the joint separate from the cartilage by loose areolar tissue and finally blends with the periosteum covering the anterointernal surface of the tibia. These layers, deep fascia and internal lateral ligament proper, are blended to form the capsule as seen at an operation. It would seem that the operation findings bear out the view suggested above, viz, that the connection between the internal lateral ligament and the internal semilunar cartilage is less close than has been generally supposed. The cartilage has its own tibial attachments that are responsible for many of its fractures.

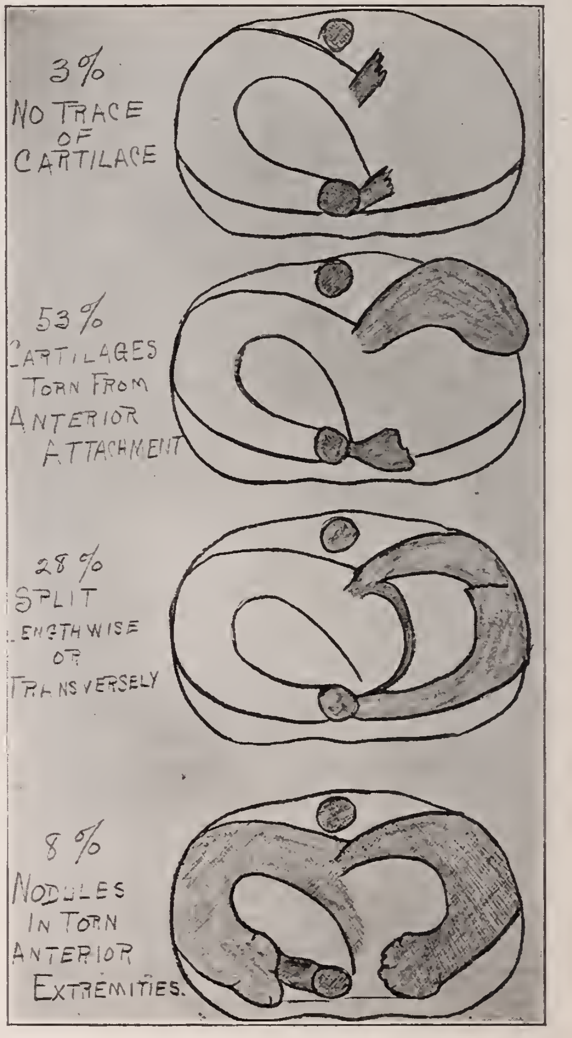
3%
NO TRACE OF CARTILAGE
53%
CARTILAGES TORN FROM ANTERIOR ATTACHMENT
28%
SPLIT LENGTHWISE OR TRANSVERSELY
8%
NODULES IN TORN ANTERIOR EXTREMITIES.

Fig. 5. Common types of semilunar cartilage injuries.

CLASSIFICATION OF KNEE DERANGEMENTS

As we all know, there is a wide distribution of classified knee injuries. You are all familiar with Sir Robert Jones' old list of 117 cases; it was used as a form of guide in army work (fig. 5).

Of the newer statistics Fisher makes a report upon cartilage injuries, showing the right knee involved in 67 per cent of the cases and the left knee 33 per cent. Longitudinal fractures of the semilunars predominated with 38 per cent, detachments occurring in 33 per cent, detachments of the posterior horn in 19 per cent and transverse fractures in 9.6 per cent. According to the same observer 8 to 19 per cent in his series were injuries to the external semilunar, there being a greater percentage among his pensioners than in his private practice.

In Bristow's report upon the semilunar cartilage injuries he quotes 77 cases with the following findings:

32 cases detachment of the anterior end.
9 cases detachment of the posterior half.
8 cases torn tab in middle of cartilage.
8 cases inward dislocation whole cartilage.
5 cases normal cartilage but hyperthophied fat pads
7 cases various, obscure.

In my own experience with external semilunar cartilage fractures and tears, I have either overlooked or been unable to find but three true cases. One was in a wife of a physician with ordinary injury, sustained by stepping into a chuck-hole; another was in a severe twisting accident, where the foot caught and body was rotated in the overturn of a pile of lumber; the third appeared last December, accidental cause. All these were women.

In my internal semilunar injuries the detachment of the anterior end of the cartilage has been most common; with complete fractures about the middle of the same cartilage as close second.

SEMILUNAR DISLOCATIONS AND LOCKING

Probably the most simple semilunar abnormality is displacement with locking of the joint. This presupposes an accident, wherein one or the other side of the knee joint is opened out and the cartilage and lateral ligaments are fixed in a dislocated position. And then, as Jones says, "everything depends upon what happens when the joint closes again."

Again, some have real doubts whether dislocations frequently occurs. Fisher contended that he doubted that internal semilunars ever dislocate. The so-called dislocations in his opinion are usually incomplete fractures.

A word regarding the treatment of the locking. The acute simple cartilage dislocations, and I am one who believes that they do occur, requires manipulative treatment. This is accomplished by either "one, two, three kick" method, or by the method, where with the knee flexed the joint is widened by *adduction of the leg on the thigh.* It is important that reduction is complete, which often is not an easy matter. When the knee can be fully extended, when the pain disappears, when there has been a suitable follow-up with flannel bandage and rest for a month, we can call the case "expectantly cured."

SYMPTOMS OF SEMILUNAR ACCIDENTS

The symptoms of all semilunar accidents are more or less uniform. They usually consist in tenderness in just one spot. With one finger the patient points to some one definite spot. If acute the joint is often distended from an inflammation of the capsular structures and an increase of joint fluid. As the case progresses the acute symptoms gradually fade out, leaving the one definite symptom of localized tenderness. The patient walks about cautiously and can do a certain amount of work in spite of disability. Few of the cases get well untreated.

THE TREATMENT OF SEMILUNAR FRACTURES

What is the course to be pursued when the cartilage remains displaced, or we decide it is defective as result of lacerations? Conservative treatment is never justified. A brace to a knee is the same as a truss to a hernia.

The treatment is always surgical. We open by an L incision and inspect the joint. We note the condition of the viscus and the color and the tension of the capsular ligaments. It has been demonstrated that the removal of a semilunar cartilage is followed by a hypertrophy of the synovial membrane on the articulating surfaces of the tibia and femur, and that there is usually no untoward results in such removals. The main and important point is to get the front half of the cartilage out "slick and clean," and leave no tabs. It is not necessary to remove the posterior half, if normal and firmly attached.

A cartilage torn, lumpy, contracted had much better be taken out than retained, with the possible exception where it is firmly attached fore and aft and only loose from the lateral capsule, where we could well attempt to conserve it. It seems today to be the general opinion the world over that cartilages can be taken out and the knee thereafter function normally. It is the experience of Jones and many others that at least the internal semilunar can be taken out without any ill effects. Bristow says that "both the internal and external cartilages can be removed with surprising little interference with function."

In the technic of repair I believe in a thorough suture of both layers of the capsule; in the use of one row of fine linen and externally many rows of fine chromic stitches, all of them extrasynovial, to insure against leaking and instability, and to produce much scar-tissue formation. Aftertreatment consists in a long leg cast for seven or eight days, followed with flannel bandaging for a month or two. Weight-bearing is permitted after a fortnight.

One might bear in mind a sex element in semilunar defects. It is true that, while the male can be shorn of his semilunars without impairment, the external semilunar in females is the one cartilage that has an appeal for conservatism. This is due to the wider pelvis and a greater need for the full cushion effect between the femur and tibia in the outer articulation, where the greater strain in the female knee is naturally borne. There is a feeling that the external semilunar in women should be reattached to the tibia, if it is possible to do so. I have scarafied the cartilage, not too badly lacerated, and curretted the seat on the tibia and drilled oblique holes in the tibia for suturing. The results have been satisfactory.

POSTOPERATIVE INSECURITY OF THE KNEE

There is one sequela that sometimes arises after surgery for these internal knee conditions that is bothersome. I refer to a symptom during late convalescence of a weakness or insecurity of the knee. The patient has been to work but he insists that there is a pulling in the joint. He has to assist his limb on arising, boarding street-cars, etc. Such symptoms are often due to tiny adhesions, much in character as we have in villous arthritis, the feelings of insecurity being due to a pull in an unusual direction of these restricting fibers. Good results are often obtained by a vigorous manipulation under an anesthetic.

CRUCIAL LIGAMENT INJURIES

At the London session I was amazed at the attitude of British surgeons regarding the relative importance of the crucial ligaments. While there were many standpatters clinging to the accepted opinion, there was a decided opinion adverse to the vital function and importance of these greatly feared structures in the adult knee. So often have these surgeons found the crucials missing or mere thready bands in the course of exploration of adult knees, that they are coming to believe that the crucials offer support in the young until their capsular structures and musculature are sufficiently strong to support knee functions, and then they become auxiliaries.

Further, if the crucials are fractured and the knee is given adequate treatment by *sufficient immobilization toward capsular repair,* a perfectly normal knee can result. I was interested to hear Sir Robert Jones corroborate the last statement, and to say that any operation for the restoration of the crucials was "love's labor lost," as he and Lovett had never seen a good repair of a crucial. It appears we cannot restore that element of perfect and permanent tension in our transplanted tissues. I am a bit old fashioned and, while I am happy that I do not see many crucials fractured, I feel that they cannot yet be disregarded.

You will recall that the anterior crucial is an interosseous band, extending from the area in front of the spine of the tibia near the same region as the attachment of the semilunars and extending backward, upward and outward in an oblique direction, and is inserted behind the back part of the outer condyle of the femur. Also, that the posterior crucial is a short cord crossing the former in an x-fashion, and arising behind the tibial spine to proceed upward, forward and inward to its insertion into the outer part of the inner condyle. It should be remembered that the anterior crucial is tense when the knee is extended, and the posterior is tense when the knee is flexed. An injury or rupture of the crucials always accompany other joint injuries.

I am frank to say that I have very often been astonished at the frailty of these structures and am more or less willing to agree to a limited function for them. With our old conception one would naturally expect in a rupture of the crucial considerable permanent impairment of knee stability to result. It is a general experience that, after the subsidence of the subacute stage, this impairment does not usually persist, and it is my belief that by some compensatory development in the capsular ligaments all the functions of stability of the crucials are adequately cared for.

SYNOVIAL HYDROPS

On the other hand, there is another residual condition, having nothing to do with stability, following knee injuries that must be noted. I refer to continuous hydrops. This is a secondary condition due to tiny fractures along with ligamentous tears. I have several times noted in exploring knees for the removal of joint mice that one or both of the crucials were missing. I have coupled with this fact that I have found a forming "mouse" upon a pedicle of a crucial. Of course, it is commonly believed that most cartilaginous joint mice have as their start some abnormality of the cartilages, but to the subject, chronic hydrops. We have observed in those knees, whose only apparent pathology was a simple hydrops, there was present an unhealed pit, where once there had been either the attachment of a crucial or capsular ligament. Why these pits don't head over is a question. Such pits are capable of seepage and on occasion do secrete to joint fullness until repaired.

TRAUMATIC BURSITIS OF THE KNEE

An acute bursitis is due to a blow on a bursa, as when one is struck by a bat or falls on a step. The walls of the bursa rapidly expand, and the effusion remains stationary until in a few days absorption follows, and if aided by a restraining bandage entirely disappears. Injure the same bursa frequently, bump it over and over as does the saleslady in closing the counter drawers or as does the automobile driver by striking his knee habitually against the shifting lever, then arises a chronic bursitis which is persistent or might end in a bursal tumor (fig. 2).

There are many bursae about the knee. Of these there are four that are especially prone to injury, (1) that most often affected being the bursa patellæ. This lies like a membraneous sac, the size of a half dollar, over the patella and the upper half of the ligamentum patellæ. *It has no connection with the knee joint.* It can be opened, enucleated or injected with impunity. (2) The tubercle bursa extends from the tibial tubercle up under the patellar ligament. It sometimes connects with the joint. When distended it protrudes to either side of the ligament. (3) The subcrureus bursa lies under the quadratus femoris. It is variable in size and is capable of expansion. It communicates with the knee joint by a large opening. This bursa might well be considered a part of the knee joint. (4) The bursa beneath the semimembranous tendon in the popliteal space; this also communicates with the knee.

Chronic bursitis in these various bursae means, first, a permanent enlargement of the sacs. The walls at first thinned are later hypertrophied to double their original thickness. Second, fibrin and cheesy matter becomes deposited within the sacs. At times the sac contents organize or calcify and produce the bursal tumors. These are specially prone to irritation on account of their proximity to moving joints. Sometimes they cause pain. The symptoms are the same as bursal tumors in the shoulder, beneath the achilles or under the iliopsoas at the hip.

The treatment of these bursal conditions at the knee is definite. A chronic patellar bursitis had best be aspirated and the sac injected with an irritant of the iodine class. After manipulation of the injected irritant the knee is constricted with flannel bandages. If this treatment is unsuccessful, the sac must be dissected away.

The same treatment is accorded the tubercle bursa. If the enlargement has been present a long time, one may presume that with the remainder of the knee uninvolved the sac does not communicate with the joint. However, it is well after aspiration to inject this sac with sterile water and withdraw to make sure of no leaks. The other bursae all communicate with the joint and preclude the use of irritants. I do not know how better to treat them than by elastic constriction.

INJURIES TO CAPSULAR STRUCTURES

Any of the strong capsular structures about the knee may sustain injury. However, the posterior ligament usually escapes on account of its peculiar oblique position (oblique fasciculus). *Most of the traumas are destructive to the laterals.* The patellar sesamoid (patella) usually fractures before the ligament tears. The symptoms are quite uniform, namely, a feeling of weakness and abnormal play in the knee, and, as said before, there is always a generalized soreness about the whole joint. While these injuries are common, there are no new or controversal matters about them, as far as I know. Their treatment is always surgical.

INFLAMED FAT PADS

Too little importance probably has long been placed upon the mechanical irritations of inflamed fat pads. Normally there are several postpatellar rolls of fat in most joints. In the fleshy there are often many more. It is a general belief that in wasting diseases the fat about the knee joint is about the last to disappear for general needs.

The joint fat pads have a definite structure. They are enclosed in limiting membranes, have a net-work of connective tissue that subdivides them into smaller masses, and have an organized capillary blood supply. These pads are capable of increasing in size for some reason when injured. It is not certain whether it is an inflammation or a proliferation. When they do enlarge they cause much the same symptoms as an arthritis. Probably much arthritis of the knee is in reality the signs of enlarged fat pads.

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EDITORIAL

JAMES BEATY EAGLESON

The death of Dr. Eagleson has removed one of the most prominent and notable medical men of the Northwest, as well as a leader of civic affairs of Seattle. Coming to this state forty years ago an unknown young physician, the local representative of the United States Marine Hospital Service, he became at once an outstanding figure in the community. His physique gave him a distinguished appearance. He was a leader in all phases of medical activities during his professional career. He was one of the organizers of the county medical society and took an active part in its development and its progress during many years. He was a charter member of the State Medical Association and gave to it the benefit of his wise counsel and experiences through all its years of existence. With few exceptions, no hospital enterprise was launched in Seattle in which he did not take an active part and serve on its boards and committees.

Being the first man in the West to devote his entire practice to surgery, he was recognized as a conservative, skilful and dependable surgeon of the first class. For many years his reputation has extended beyond local bounds, and he was well known in national surgical societies. When the American College of Surgeons was established he was chosen one of the regents and faithfully served in this capacity till his death. He was never a voluminous contributor to medical journals, but his ability and attainments in all surgical lines were universally recognized.

His leadership extended into many lines of activities. Nearly thirty years ago he was one of a small group of men who determined that a medical library was a necessity for the local profession. He penned the original articles of incorporation, and for a number of years the books were stored in his home as they were gradually accumulated. His active interest and support in this institution was continuous.

Early in his career he took an active interest in medical military affairs. At one time he served as Surgeon General on the staff of the Governor. Even before our country entered the World War, he had made a study of medical and hospital problems, and when it was determined to establish a base hospital in this section of the country he was the logical selection to organize and supervise Hospital No. 50. During its development and active service in France his wise counsel and efficient leadership endeared him to the doctors and nurses connected with that hospital to a degree that made them all his devoted followers and admirers. No medical man connected with the war service labored more assiduously and effectively than did he during the whole period of his service, in consequence of which he was known as one of the outstanding army surgeons of the country.

Northwest Medicine is largely indebted to Dr. Eagleson for its inauguration and continued existence. From the outset he was business manager and the wise adviser through its earlier years. Due to his generosity on many occasions financial disaster was averted, when he met accounts that otherwise could not have been paid. In more recent years his advice and assistance were always available when new problems were to be met and wisely solved.

He had the unique experience of observing his home city develop from an overgrown village to one of the large cities of the land. In this growth he had an active part such as seldom falls to the lot of a medical man. Among committees pertaining to health and sanitation he was an active participant, doing his full share of the labors. When the city charter was revised some twenty years ago, he served as a member of the charter committee that sat for many weeks, thus engaging in arduous labors that extended over a long period of time. His efforts in this and other capacities were freely expended for the welfare of the city which he loved.

From his Scotch-Irish ancestry he inherited qualities of uprightness and honesty of purpose, with firm religious convictions, which characterized his whole life and identified him as a typical Christian gentleman. These principles were exemplified in his daily experiences and his relations with his fellow men. He was a prominent participant in church affairs, and for many years served on the governing board of the Young Men's Christian Association. One of his firm and fixed principles was opposition to the use of alcohol and personal abstinence. This was more noticeable in his younger years when indulgence was well nigh universal and

JAMES BEATY EAGLESON, M.D.

the traffic loomed large in the life of the state and city. In those days it required strength of purpose to be known as a prohibitionist but he witnessed this principle attain state and national adoption.

Among his fellow practitioners and his host of patients he was distinguished by his genial smile and his native sense of humor which constantly was demonstrated in his association with others. He was generous to a degree in the expenditure of both time and efforts for the assistance of fellow practitioners and his financial resources were freely dispensed in response to endless appeals for manifold forms of assistance. Since the end of life is the inevitable experience of all mankind, one cannot conceive of a more satisfactory termination than was presented in the experience of Dr. Eagleson. At the onset of his fatal ten days illness he was actively at work, probably as busy as at any time in his years of practice. No period of invalidism was his lot, thus complying with the oft expressed wish that his earthly career might be terminated while still in the harness. Though his many friends grieve over his departure, and regret that his useful life could not have been extended over many more years, they rejoice in the recollections of his busy life constantly filled with good deeds and his example to all medical men of an ideal life of useful activities.

CLINICAL LABORATORY SERVICE

Of recent years there has been frequent discussion in medical journals and before societies regarding the status of the clinical laboratory, which represents one of the recognized specialties in the medical profession. It is frequently lamented that laboratory work has so largely fallen into the hands of lay technicians, and has been utilized for commercial exploitation to such an extent in some sections that skilled laboratory workers have even contemplated withdrawal to other forms of professional activities.

At the annual meeting of the American Medical Association at San Francisco, in 1923, representatives of the American Chemical Society and the American Association of Pathologists and Bacteriologists petitioned the national organization to undertake supervision of clinical laboratories and to counteract, if possible, the drift toward lay commercialism as developing in laboratory work. The whole question was referred to the Council on Medical Education and Hospitals. They proceeded to secure a complete list of laboratories in the country, and prepared a schedule of essentials for an approved clinical laboratory which was adopted by the House of Delegates at its 1926 session in Dallas. A questionnaire was utilized, by which the detailed facts regarding each laboratory could be obtained. Information concerning each was suppplemented through the assistance of committees of laboratory experts appointed in each state. At the present time three hundred and fourteen laboratories have reported to the Council, of which one hundred and fifty-one, after careful investigation, have been placed on the approved list. Other applications for approval are constantly being received.

The purpose of the Council in these investigations is to render every possible assistance to laboratories that they may become eligible to the accepted list. Each is informed regarding its deficiencies, and the spirit of the movement is constructive throughout all its efforts. As a result of these labors it is reported already that a number of laboratories formerly run by technicians, and only nominally under medical supervision, have come under the ownership and actual control of clinical pathologists of high standing and ripe experience. A group of laboratories under control of technicians has gone out of business, and there is an increased demand for pathologists to man the clinical laboratories of the country. The director of the Mayo Foundation has stated that salaries offered their pathologic graduates are double those offered other graduates of the Foundation.

It is stated that there is a more hopeful attitude on the part of clinical pathologists themselves, and there seems to be less feeling of unsteadiness in this specialty than existed a few years ago. It is not known to what extent doctors have actually discontinued sending specimens to unapproved and are concentrating their work for approved laboratories. The character of the laboratories of the future and the reliability of their work rest entirely with the medical profession of any community. If trained medical men are to devote their lives to this specialty, they must receive the support and cooperation of the professional men and women among whom their work is conducted. If their patronage is to go to nonmedical institutions, the permanency of this specialty will be jeopardized and well trained physicians cannot be expected permanently to undertake this work.

MEDICAL NOTES

American College of Physicians' twelfth annual clinical session will be held at New Orleans March 5-9. The many hospitals and medical institutions of this city make it one of the leading medical centers of America. The attractions of the city are manifold so that it is known as one of the most interesting to visitors. An elaborate program of papers has been prepared, representing the best talent among the internists of America, Canada and Europe. A good representation of members from the Northwest expect to attend this meeting.

OREGON

Jubilee Meeting Honors Pioneer Physician. The Alumni Association of the University of Oregon Medical School held its Fifteenth Annual Session in conjunction with the Portland Academy of Medicine in Portland January 12-13. The sessions honored the fiftieth anniversary in practice of Dr. S. E. Josephi, for many years dean of the medical school and now dean emeritus. The morning hours were devoted to clinics by staff members of the Multnomah and Shriners' hospitals. At the afternoon sessions papers were read by the following: Drs. M. L. Bridgeman, J. A. Gilbert, H. H. Foskett, O. M. Babbitt, W. C. Hunter, E. A. Sommer, H. C. Bean, Marr Bisaillon, F. A. Menne, F. E. Butler, M. L. Margason, H. M. Greene, G. A. Cathey and M. W. McKinney.

The Portland Academy of Medicine at an evening meeting, January 12, presented its guest of honor, Dr. Arthur L. Bloomfield, professor of medicine at Stanford University, San Francisco, Calif. He delivered an address on "Observations on the Composition of Gastric Juice and the Mechanism of Its Secretion."

LAW VIOLATORS CONVICTED. R. E. Lang, Portland woman chiropractor, was found guilty of practicing medicine without a license by a circuit court jury on Jan. 12. She had been convicted in the district court on Nov. 1 and fined $150 and sentenced to ten days in the county jail, but appealed the case to the circuit court. Circuit Judge Stevenson affirmed the sentence of the lower court. She administered various medicines to a patient who later died.

M. E. Heath, Portland druggist, pleaded guilty on Jan. 24 to violation of the public health statute which prohibits the sale of any drug for the treatment of venereal disease except on the prescription of a licensed physician. He was fined $50.

These cases are the result of a campaign now being waged against violations of public health laws by Special Agent C. A. Morrow of the State Board of Medical Examiners. The cases were prosecuted by Deputy District Attorney C. W. Kirk, who has successfully prosecuted many violations in the last few months.

SANITARIUM TO BE EXPANDED. Plans have been announced for the enlargement during the coming year of the facilities at the Portland Sanitarium. The new buildings contemplated include a wing for private patients and a nurses' home. The cost of the improvements is estimated at $110,000.

APPOINTED TO EMERGENCY HOSPITAL. Dr. John G. Abele has announced the appointment of Drs. Cecil Ross, L. P. Lind and Max Himmelfarb as members of the staff of the city Emergency Hospital. They are to replace medical students who formerly were in charge of the work.

CONTRACT FOR VETERANS' HOSPITAL AWARDED. The N. P. Severin Company of Chicago was awarded the contract for construction of the United States Veterans' hospital at Portland and will work on the new buildings in the near future.

BEQUEST TO HOSPITAL. Mrs. Elizabeth C. Good, a pioneer resident of Portland, who died January 3, has bequeathed the sum of $15,000 to the Good Samaritan hospital, and $5,000 to the Portland Open Air Sanatorium.

PHYSICIANS PLAN HEALTH RESORT. It has been recently announced that a group of sixty-three prominent physicians of Portland have formed a company for the purpose of establishing a hotel and health resort at Collins Hot Springs, near Stevenson, Wash. The first unit is to be constructed in the near future at an estimated cost of $100,000.

APPOINTED CHAIRMAN OF SECTION CONFERENCE. Dr. Ralph C. Matson of Portland has been appointed chairman of the clinical section of the National Tuberculosis Association convention, which will be held at Portland June 18-22.

BOARD OF HEALTH SELECTS OFFICERS. The Oregon state board of health held its annual meeting at Portland January 10. Officers for 1928 were elected as follows: President, Dr. E. B. Pickel, Medford; vice-president, Dr. Harold C. Bean, Portland; secretary, Dr. Frederick D. Stricker, Portland. The board determined to introduce a bill at the next session of the state legislature, requiring all local health officers to take a correspondence course in public health given by the state health board before they are appointed or reappointed.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY. At the recent annual meeting of the Portland City and County Medical Society, the following officers were elected for the ensuing year: President, Dr. C. J. McCusker; vice-president Dr. Karl H. Martzloff; secretary, Dr. E. W. St. Pierre; treasurer, Dr. Kittie Plummer Gray. Delegates to the state society meeting include Drs. A. W. Baird, C. H. Manlove, F. E. Boyden, Paul Rockey, A. E. Mackay, H. S. Lamb, John Rankin, E. E. Rippey, T. H. Coffen, Frederick Ziegler, Ray W. Matson, E. E. McDaniel, S. H. Sheldon and E. A. Sommer. New Counselors elected were Drs. R. B. Dillehunt, Laurence Selling, W. K. Livingston, J. H. Fitzgibbon, C. H. Smith, Wilson Johnston, F. F. Mount and H. P. Rush. Counselors continuing from 1927 are Drs. William House, H. C. Bean, F. D. Stricker and A. G. Bettman.

JACKSON COUNTY MEDICAL SOCIETY has elected the following officers for 1928: President, Wm. W. P. Holt, Medford; vice-president, Mattie B. Shaw, Ashland; secretary-treasurer, E. W. Shockley, Medford; delegate to State Society Meeting, W. H. Heckman, Central Point; Board of Censors, W. R. Adams, Medford; E. A. Woods, Ashland; W. H. Heckman, Central Point.

CENTRAL WILLAMETTE MEDICAL SOCIETY at a recent meeting elected the following officers for 1928: President, Dr. E. L. Zimmerman, Eugene; Vice-President, Dr. R. S. Rogers, Junction City; Secretary-Treasurer, Dr. C. E. Hunt, Eugene; Censor, Dr. R. M. Waltz, Brownsville.

DR. ALEX S. WILSON, who has been engaged for several years in the practice of medicine in India, was a recent visitor in Klamath Falls. He plans to locate permanently in the near future in Western Washington.

DR. C. D. DONAHUE, Eugene, has returned to that city following a three months' postgraduate study in Vienna, Austria.

APPOINTED TO CHAIR OF MEDICINE. Dr. Laurence Selling, of Portland, has been appointed clinical professor of medicine and head of the department of medicine at the University of Oregon Medical School.

VALUE OF LATERAL VIEWS OF THORAX. Samuel Brown and H. B. Weiss, Cincinnati (*Journal A. M. A.*, Jan. 21, 1928), stress the value of the routine use of lateral views in the study of the lungs, pleurae and mediastina. In cases in which abnormal shadows were recognized in the anteroposterior views, their exact location and probable nature were more accurately determined. Lesions of the lungs behind or in front of the heart which often escape detection are readily revealed in the lateral views. The use of the lateral view in pulmonary tuberculosis is not recommended. The superposition of the lungs very often obscures the finer changes in an early tuberculous involvement. In advanced cases of pulmonary tuberculosis, the lateral view may be of much assistance in showing the full extent of the involvement and the exact location of the cavities.

CHILDREN'S ORTHOPEDIC HOSPITAL

SEATTLE SURGEONS HOLD ANNUAL CLINICS. The Seattle Surgical Society held its annual clinics at Providence Hospital January 13-14. Dr. Verne C. Hunt, of the Division of Surgery, Mayo Clinic, Rochester, Minn., was the guest of honor. The morning sessions were devoted to a discussion of clinical cases by Dr. Hunt. On the afternoon of the second day several members presented surgical patients before the society and its guests. The program culminated in a banquet at the Rainier Club, at which Dr. Hunt delivered an address upon the subject of "A Consideration of the Surgical Conditions of the Upper Urinary Tract."

WASHINGTON

HOSPITAL ADDITION DEDICATED. On Jan. 15 the new wing of the Children's Orthopedic Hospital, Seattle, was dedicated. The building of this new wing represents the culmination of twenty-one years of effort on the part of the Board of Trustees. The new building is four stories in height and of fireproof construction. The Northwest may well be proud of this institution, representing as it does, one of the very finest institutions of this type in the entire country. The old building is to be remodelled to conform in architecture to the new, and will increase the capacity to approximately one hundred and fifty beds. While the work of the hospital is essentially charitable, many private cases have been admitted in the past, and probably a great many more will be admitted in the future. The new hospital is equipped with every modern convenience for the care of sick children, the physiotherapy department being unusually elaborate in this particular. Among other features, very unusual in any hospital, is a rather large swimming pool, wherein the children with infantile paralysis will take treatment. We feel that the Board of Trustees, and the people of the Northwest generally, are to be congratulated on the completion of this hospital.

BELLINGHAM HOSPITAL ADDITION OPENED. The new H. A. Compton pavilion of St. Joseph's Hospital, Bellingham, was opened January 15. The new wing is named in honor of the late Dr. H. A. Compton, a pioneer physician of Bellingham. It provides accommodations for seventy-five additional patients at the institution.

HOSPITAL TO BE ENLARGED. The Virginia Mason Hospital, at Seattle, has concluded the purchase of a site adjoining the present building, on which it plans to erect a new addition. Construction is expected to begin within the present year.

MEMORIAL GIFT TO HOSPITAL. The Tacoma General Hospital has announced that Mrs. Sabra W. Schug, of Tacoma, wife of the late Dr. Frederick J. Schug, has donated a large sum of money to that institution. The gift is designed to serve as a memorial to her husband.

MEDICAL ARTS BUILDING FOR SPOKANE. Mr. L. N. Rosenbaum, New York and Seattle capitalist, recently announced that a syndicate which he represents has made definite plans to erect a medical arts building in Spokane. The new structure, which will occupy a portion of the ground now covered by the Auditorium Theatre, will be at least eight stories in height. Its estimated cost is $2,000,000. It is expected that the work of erection will commence in the latter part of the present year.

BASIC SCIENCE EXAMINATION. A regular examination was held in the basic sciences at Seattle, Jan. 12-13. Sixty-one applicants passed, of whom six were osteopaths and two chiropractors, the remainder being physicians. Two applicants failed, an osteopath and a chiropractor.

PHYSICIAN IS AUTHOR. Dr. J. H. Mahon, who was engaged for many years in practice at Ellensburg, has recently published a book, entitled "Vienna of Yesterday and Today." The volume is designed to aid tourists who are desirous of ascertaining places of interest to visit in that city, and was written by Dr. Mahon at the conclusion of several years spent in travel on the Continent.

TWENTY YEARS IN HEALTH OFFICE. Dr. W. W. Ballain recently completed a term of twenty years as city health officer of Bellingham. He is succeeded by Dr. I. W. Powell, who is the first health officer to be appointed under the recent charter amendment which provides for a term of two years in that office.

NEW COUNTY HEALTH OFFICER APPOINTED. Dr. H. M. Berge of Everett has been appointed county health officer of Snohomish County. He succeeds Dr. F. A. Franke, who recently resigned.

RESIGNS FROM VETERANS' HOSPITAL. Dr. De Witt Burke, for the past two years in charge of the x-ray department at the United States Veterans' Hospital at American Lake, has resigned. He will engage in practice at Portland, Ore.

LEWIS COUNTY MEDICAL SOCIETY. At a regular meeting of Lewis County Medical Society, held at Centralia, Jan. 9, the following officers were elected for the ensuing year: President, R. R. Stephenson, Centralia; Vice-President, A. L. Ward, Onalaska; Secretary-Treasurer, Rush Banks, Centralia.

Dr. L. G. Woodford, of Everett, has been named consultant for Aldercrest Sanatorium, the tuberculosis hospital of Snohomish County.

Heads Hospital Staff. Dr. J. Richter was recently elected president of the staff of the Shelton General Hospital.

Physician Honored. Dr. Irvin Finkenstein has been elected president of the Kiwanis Club of Auburn.

Dr. Boyd N. Collier, of Seattle, has moved to Darington, where he will take charge of the Darrington Hospital.

Medical Weddings. Dr. Stanley Holton of Sedro-Wolley was married to Miss Rue Anning of Tacoma, December 14. Dr. Oza Lee James and Mrs. C. M. Cheatham, both of Spokane, were married in that city December 23. Dr. Walter J. Stark of Spokane was married to Miss Helen M. Smith of Tampa, Fla., at Spokane, Jan. 25.

IDAHO

Hospital Open to Cultists. The Supreme Court of Idaho in a recent decision has upheld the District Court in the matter of eligibility of physicians to practice in the Twin Falls county hospital. Some time ago the county commissioners of Twin Falls, upon the advice of the local medical association, passed a resolution allowing only the graduates of regular medical schools to take care of patients in the county hospital. The law was contested and has attracted nation-wide interest. The Supreme Court affirms the previous decision that all duly licensed practitioners, including osteopaths and others, may be allowed to practice in a hospital maintained by a county.

Hospital Staff Elected. At a meeting of the staff of Providence Hospital, Wallace, January 11, Dr. C. S. Stone was reelected president for the ensuing year. Other officers elected were: Vice-President, Dr. F. L. Quigley; secretary, Dr. H. C. Mowery.

Joins Veterans' Hospital. Dr. G. H. Lowthian, formerly a practicing physician at Millbank, South Dakota, has been appointed to the staff of the United States Veterans' Hospital at Boise.

Dr. C. F. McGee has resumed practice at Moscow, following a recovery from throat infection which he suffered last December, and which necessitated his making a trip to the Mayo Clinic at Rochester, Minn., for treatment.

Appointed to State Board. Dr. D. E. Cornwall of St. Maries has been reappointed a member of the 1928 state board of medical examiners.

Medical Wedding. Dr. C. A. Meyer of Troy was married December 26 to Miss Gunda Goodmanson of Seattle, at the Tabernacle Baptist Church in that city.

OBITUARIES

Dr. James B. Eagleson, Seattle, Wash., one of the most prominent pioneer physicians of the Northwest, died at his home Jan. 26, aged 65 years, from cerebral hemorrhage following a week's illness from influenza. He was born at Chillicothe, Ohio, Aug. 30, 1862. He graduated from the College of Physicians and Surgeons, Chicago (now the School of Medicine of the University of Illinois), in 1885. He then came to the Pacific Coast, where he was attached to the staff of the United States Marine Hospital at Port Townsend. He located in Seattle in 1887, where for two years he was with the United States Public Health Service. He then entered general practice but in later years confined his activities entirely to surgery. He served terms as president of King County Medical Society and Washington State Medical Association. He was prominent in civic affairs, particularly in the Seattle Chamber of Commerce and Young Men's Chirstian Association.

At the outbreak of the late World War Dr. Eagleson organized Base Hospital No. 50, which rendered its full share of service on the battlefields of France under his command. He was promoted to the rank of Lieutenant Colonel and was made a Chevalier of the Legion of Honor. The final victory was for him clouded with sorrow, as his only son, Lieutenant James B. Eagleson, Jr., died of influenza which he had contracted upon shipboard while returning from service in France. He was one of the founders of the College of Surgeons. Besides membership in a number of local medical societies, he was a member of the American Society for the Advancement of Science, the American Academy of Political Social Science, the Western Surgical Society, the Pacific Coast Surgical Society and the American Legion. He was medical director of the Northern Life Insurance Company.

Dr. Thompson G. Heine, Medford, Ore., died at his home December 27, following a long illness, aged 64 years. He was born in New Brunswick, Canada, in 1863, and graduated from the Minnesota Hospital College (now the University of Minnesota Medical School), Minneapolis, Minn., in 1888. He practiced for a short time at Centralia, Wash., and Phillipsburg, Montana. Later he engaged in a course of postgraduate study in diseases of the eye, ear, nose and throat, afterwards settling in Butte, Mont., where he practiced for seventeen years. He then moved to Medford where he practiced until his death.

Dr. John W. Crooks, Seattle, Wash., died January 6 at Providence Hospital, following an illness of three weeks, aged 52 years. He was born at Olathe, Kansas, in 1875, and graduated from Pittsburgh Medical College in 1900. He located in Seattle in 1901 and practiced continuously there until the beginning of his last illness.

Dr. Margaret Teigen, Everett, Wash., was struck and fatally injured by an automobile at Everett January 10. She was born in 1870, and graduated from University of Illinois College of Medicine, Chicago, in 1904. She had practiced in Everett for several years.

Dr. N. M. Baker, Spokane, Wash., died at his home Jan. 24, following a protracted illness, aged 68 years. He was born at Red Wing, Minn., in 1859, and was graduated from the University of Pennsylvania Medical School in 1889. He located soon afterward at Spokane and practiced continuously in that city until forced by ill health to retire four years ago. He was elected coroner of Spokane County and served two years in that office.

Dr. Joseph D. Morris, Seattle, Wash., died of senility at the home of his daughter in that city Jan. 22, aged 94 years. He was born in 1834, and was graduated from Northwestern University Medical School, Chicago, Ill., in 1863. He practiced for many years in Seattle and Marysville, Wash., and at one time was coroner of Snohomish county. He retired several years ago on account of advancing age.

Dr. Rufus P. Moore, Seattle, Wash., died at his home Jan. 26, following an illness of three months' duration, aged 67 years. He was born in 1860, and was graduated from Vanderbilt University School of Medicine, Nashville, Tenn., in 1893. He had resided in Seattle for the past seven years, previous to which time he was engaged in practice in Davenport, Iowa.

REPORTS OF SOCIETY MEETINGS

OREGON

POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., L. O. Clement; Secty., W. W. Baum

Polk-Yamhill-Marion society held its annual meeting at Salem, Jan. 17.

PROGRAM

"Concerning the Differential Diagnosis of Pulmonary Tuberculosis." Dr. Marr Bisaillon, Portland.

"Acute Anterior Poliomyelitis." Dr. H. A. Gueffroy, Salem.

The following officers were elected for the ensuing year:

President, Dr. W. W. Allen, Mill City; First Vice-President, Dr. J. O. Van Winkle, Jefferson; Second Vice-President, Dr. Mary Rowland, Salem; Third Vice-President, Dr. F. R. Bowersox, Monmouth; Counselors: Drs. W. B. Morse, Salem; W. H. Barendrick, McMinnville; L. O. Clement, Salem. Secretary-Treasurer, Dr. W. W. Baum, Salem.

WASHINGTON

CLALLAM COUNTY MEDICAL SOCIETY

Pres., P. H. Brown; Secty., W. H. Taylor

Clallam County Medical Society held the regular meeting at the Port Angeles Hospital and Sanatorium January 9.

Drs. Jay I. Durand and H. J. Wyckoff of Seattle were guests of the society. They spoke respectively upon the medical and orthopedic problems involved in the treatment of poliomyelitis.

KING COUNTY MEDICAL SOCIETY

Pres., A. J. Wanamaker; Secty., W. W. Bell

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Bldg., Seattle, Jan. 9, President Wanamaker being in the chair. There were 259 members present. The meeting was opened with a selection by the orchestra, composed of twenty members of the society. Minutes of the meeting of December 5 were read and approved.

The following members were elected to membership in the society: Drs. D. D. Corlett, S. H. Ferguson, A. H. Grauman, C. L. Morrow, E. W. Rawson and J. W. Unis.

Secretary W. W. Bell read the annual report of the auditor, which was accepted as read.

A short history of the development and growth of the Bulletin from 1898 to the present time was presented by the executive secretary, Miss Alice Stotlar.

Balloting for officers and delegates for the coming year was conducted, reports of committees being presented while votes were being counted.

Dr. P. V. von Phul presented a report of the Hospital Survey Committee.

Dr. Frank L. Horsfall supplemented a printed report of the Welfare Committee, urging that more serious consideration be given to attending funerals of deceased members. Dr. C. A. Smith recommended that a meeting near the close of year be devoted to memorial services for deceased members. A motion to that effect was offered and carried.

Dr. Frederick Epplen spoke of the proposed visit of Dr. Julius Barr of Vienna, and that of Dr. Weber. It was voted that the society invite these men to be guests of the society at their convenience.

Dr. Wanamaker recommended that Dr. Frank Clancy be appointed official cartoonist for the Bulletin.

Dr. E. Weldon Young spoke on the function and importance of the medical library, giving an outline of its origin and development to the present time.

Dr. B. T. King invited members of the society to attend the clinics and banquet given under the auspices of the Seattle Surgical Society January 13-14. He stated Dr. Verne C. Hunt was the guest of the society, who would hold the clinics at Providence Hospital.

Dr. Henry Takacs read a paper, "Shall the Practice of Medicine Remain a Profession or Become a Business?" This was a discussion of contract practice, in which its abuses and the injustices emphasized which it imposed on other members of the professon. Dr. Crookall called attention to the section of the By-Laws of the society which provides that, "Any member of this society who shall continue or hereafter agree or contract to be employed by a commercial hospital organization shall be liable to suspension from the society during the period of his connection with such association."

The following officers were elected for the year 1928: President, Dr. David C. Hall; vice-president, Dr. Walter Kelton; secretary-treasurer, Dr. C. W. Shannon; trustees, Drs. C. H. Hofrichter and Frederick Slyfield. Delegates to Washington State Medical Association annual meeting: Drs. O. A. Nelson,

G. W. Swift, Roger Anderson, B. T. King, A. H. Peacock, A. C. Crookall, H. E. Coe, F. T. Maxson, W. W. Bell and C. R. Castlen.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. C. Wheeler; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held on the second floor of the Washington Building, Tacoma, January 12, President Ernest C. Wheeler presiding.

PROGRAM

A paper on "Ureteral Stones" was given by Dr. H. D. Jonez. It was illustrated with many lantern slides. The paper was discussed by Drs. C. S. Pascoe, C. H. Doe and C. H. Kinnear.

Dr. Dorman reported a case of brain tumor in a girl of seven, presenting as the only initial symptom vomiting. The patient lived for seven months after this.

Park Davis & Company presented a moving picture, demonstrating the work of their biological department.

BUSINESS

The application of Dr. James M. Odell was read and referred to the Trustees.

A communication from Dr. Ralph L. Taylor in regard to location was read.

A communication was read from H. D. Schaeffer asking information in regard to physicians treating rheumatism. It was left to the secretary to answer.

A communication was read from Dr. Arthur Crookall of Seattle, chairman of the Executive Committee of the Public Health League, in regard to articles appearing in the Tacoma Times by a Dr. McCoy.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., Mitchell Langworthy; Secty., R. M. Schulte

The annual meeting of the Spokane County Medical Society was held January 12. The following officers were elected for the ensuing year: President, Dr. P. J. Gallagher; vice-president, Dr. Carrol Smith; secretary, Dr. R. M. Schulte; treasurer, Dr. Paul Remington.

Executive Committee: Drs. Mitchell Langworthy, George H. Anderson, C. H. Mowery, the president and the secretary.

Delegates to the State Medical Association meeting: Drs. Arthur Betts, R. M. Hamblen, C. H. Mowery and R. M. Schulte.

Member of the Board of Censors, Dr. R. E. Ahlquist.

Three ten-minute papers on eye, ear, nose and throat specialties were read by Drs. L. A. Parsell, Paul A. Remington and C. A. Veasey, Jr.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., E. J. Rhodes; Secty., A. E. Lange

The regular meeting of the Walla Walla Valley Medical Society was held January 12 at the residence of Dr. W. E. Park, Medical Officer in Charge, U. S. Veterans' Hospital, Walla Walla. The program was given by the Medical Officers of the U. S. Veterans' Hospital.

PROGRAM

"Diagnosis and Clinical Symptoms of Bronchiectasis" by Dr. R. A. Gunter.

"Bronchiectasis, the Differential Diagnosis and Treatment," by Dr. R. W. Smith.

"X-Ray Study of Bronchiectasis With and Without the Injection of Iodized (Lipiodol) Oil" by Dr. C J. Johannesson.

YAKIMA COUNTY MEDICAL SOCIETY

Pres., C. R. Duncan; Secty., Kay England

The annual meeting of the Yakima County Medical Society was held at Yakima, December 14, 1927.

The following officers were elected for the ensuing year: President, Dr. A. J. Helton; vice-president, Dr. D. F. Bice; secretary, Dr. J. L. McDonald; treasurer, Dr. F. W. Nagler, re-elected.

NORTH PACIFIC PEDIATRIC SOCIETY

The midwinter meeting of the North Pacific Pediatric Society was held Jan. 28 at the new Children's Orthopedic Hospital, Seattle, Wash. The morning session was devoted mainly to the display of patients by members of the society. Dr. H. C. Coe exhibited several children with hare lip and cleft palate. A boy with frontal sinusitis which necessitated radical operation was shown by Dr. D. H. Houston. Dr. Somers demonstrated a pathologic specimen taken from a newborn infant, who had died suddenly with signs of high intestinal obstruction. The upper portion of the jejunum passed in an anomalous manner through the mesentery. Dr. V. E. Spickard discussed the case of a small child with celiac disease who had been treated for over two years at the Orthopedic hospital. He emphasized the importance of long continued protein diet in this disease. Dr. Armin Rembe exhibited a girl who had recovered from erysipelas complicated by myocarditis with decompensation. The cardiac condition improved rapidly following digitalization. Dr. C. F. Eikenbary, Chief of Staff of the Children's Orthopedic Hospital, displayed patients with late infantile paralysis and tuberculosis of the spine.

The afternoon session was devoted to papers presented by guests of the society. Dr. J. Tate Mason of Seattle discussed "Some Points in the Treatment of Undescended Testes in Children." Dr. George Swift, Seattle, explained his personal investigations and treatment of idiopathic epilepsy. Dr. A. B. Hepler, Seattle urologist, talked on "Obstruction as a Cause of Persistent Urinary Infection in Children." Dr. Stanley Graham, Vancouver, B. C., discussed a case of intussusception. "Some Factors of Interest in Preventive Orthodontia" was the title of a paper read by Dr. W. R. Dinham, Seattle. Dr. Henry Odland of Seattle discussed three children who had received radium treatment for congenital vascular nevi. Drs. G. E. Coe and Arthur H. Gray discussed respectively "The After Care of Poliomyelitis" and "Erysipelas in the New-born."

The meeting culminated at the Olympic Hotel. The officers of the North Pacific Pediatric Society are Dr. R. S. Miles, of Tacoma, president, and Dr. D. M. Dayton, Tacoma, secretary-treasurer.

PUGET SOUND ACADEMY OF OPTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., H. V. Wurdemann; Secty., M. J. Morris

Dr. H. V. Wurdemann, the retiring president, tendered the members of the Puget Sound Academy of Ophthalmology and Oto-Laryngology dinner at the Seattle Yacht Club, January 31. Thirty-six members and six guests were present.

Following the dinner, a short business meeting was held. Dr. Wurdemann reviewed the work of the Academy for the past year, laying particular stress upon the value of clinical meetings.

Dr. Arthur Burns, for the members of the Academy, presented Dr. Wurdemann with an engraved plaque expressing their appreciation of his work for the Academy and in commemoration of his forty years of practice.

Three men were elected to membership in the Academy: Drs. S. Maimon Samuels, Seattle; William Ludwig, Tacoma, and John F. Gibson, Olympia.

Dr. Ernest C. Wheeler, Tacoma, was elected president for the ensuing year; Dr. Will Otto Bell, Seattle, first vice-president; Dr. J. V. Bjerken, Aberdeen, second vice-president; Dr. A. E. Hillis, Tacoma, secretary-treasurer.

IDAHO

IDAHO STATE MEDICAL ASSOCIATION

REPORT OF THE IDAHO MEMBER OF THE HOUSE OF DELEGATES AMERICAN MEDICAL ASSOCIATION, SEVENTY-EIGHTH ANNUAL SESSION, WASHINGTON, D. C., MAY 16-20, 1927, TO THE IDAHO STATE MEDICAL ASSOCIATION, IN ANNUAL SESSION, TWIN FALLS, IDA., AUG. 29-31, 1927.

This report, for obvious reasons, does not purport to be a comprehensive review nor epitome of all that transpired at the session, all standing or special committee reports or all reports and communications from the A. M. A. and journal officials, which were received by the House of Delegates. Rather it is a touch on a few things of the great many that are of special interest to the rank and file of the profession, such as might indicate the trend of organized medicine as controlled and directed by the major influences of the large medical centers of the United States.

"Newspaper publicity throughout the country was the greatest ever given an annual meeting, a reflection of the increasing interest of the public in the progress of medicine, and of the cooperation of the American Medical Association and the American press." Calvin Coolidge, President of the United States, addressed the association on the evening of May 16 and held a reception for the membership of the profession the following day on the White House lawn.

On the 17th, exercises were held at Arlington Cemetery in honor of the members of the medical profession who gave their lives in the World War.

Dr. Hubert Work, Secretary of the Interior, was honorary President of the day. A floral wreath was placed on the grave of the unknown soldier. "The first American soldier to be wounded in action was a physician; the first American soldier to be killed by the enemy was a physician; medical officers who died from all causes during the war totaled 500; total wounded and dead, 981."

More than 300 manuscripts were read in the sixteen scientific sections of the Association. The report of Drs. Minot and Murphy, of Harvard University Medical School, on "Seventy Cases of Pernicious Fever, Treated on a Calves Liver Diet," and the report of Dr. Naguchi on the isolation of the germ which causes trachoma were features of the Scientific Assembly. Another interesting feature of the meeting was the demonstration of the "Electric Stethoscope Amplifier and Receiver" by the Bell Telephone Laboratories. "Beating of the heart echoes throughout auditorium; electric stethoscope in demonstration amplifies pounding of organ ten trillion times, causing noise like thunder of rapid-fire cannon; demonstration of normal and of abnormal heart sounds were conveyed to an audience of 2500 listeners." Sounds of the heart "filtered," leaving only the sounds desired to be studied.

NOTES

Dr. Martha Welpton, San Diego, Calif., was the first lady to sit with the House of Delegates.

The Board of Trustees, as per request of the House of Delegates, maintained a full-time representative at Washington during the session of Congress.

Hygiea, 1926 publication, 50,575, a gain of 10,028 over 1925. Net loss for the year, $34,057.00.

Next meeting of the A. M. A. to be at Minneapolis; runner-up was Kansas City.

Portland also had her name in as candidate for the 1928 meeting, but Dr. Pettit, a member of the Board of Trustees, withdrew her name before the vote was taken and gave notice that Portland was a candidate for the 1929 meeting.

The Spanish edition of the A. M. A. Journal has the largest circulation of any medical journal printed in Spanish. Total circulation January 1, 1927, was 2545, an increase of 257 over the preceding year. The publication of the Spanish edition in 1926 entailed a net loss of $14,398. The A. M. A. and the Rockefeller Foundation each assume one-half of the loss.

There are now 6,946 hospitals in the United States with a total capacity of 859,445 beds. There are 578 hospitals approved for the training of interns, which provide 4,952 internships.

The Uniform Medical Practice Act was introduced into the last Congress which, if it becomes a law, will force all practitioners of the healing art in the District of Columbia to pass examination in the fundamentals of medical science.

EXCERPTS FROM JUDICIAL COUNCIL REPORTS

By request the Council defines "clinic," as used by those doing so-called group practice. Originally the word in its verbal form meant to lie down or to recline and in its nominal form it signified that on which one lies or reclines, namely, a bed. The term "clinique" was introduced in France to designate an institution or school, where students were taught at the bedside. Clinque was anglicised into clinic, but its application to a teaching institution has always been retained up to very recent times. The term "clinic" was adopted comparatively recently by a few physicians and by a greater number of groups of physicians to designate their offices or workshops, perhaps for the want of a better term, perhaps for the conveying to the public mind the idea of greater importance or institutional dignity. Whether or not the use of the term in this connection has come to stay cannot be predicted, but that its use in this way does not find justification in the original significance of the word is evident.

CONTRACT PRACTICE

At the Dallas meeting of the House of Delegates the Judicial Council was requested to investigate the subject of contract practice and report at the next meeting. "The responses sought by inquiries sent to all parts of the country were disappointing, and cannot be accepted as an indication of the prevalence of the practice. There is no doubt that the practice is growing in frequency and becoming widespread. *In fact it is entering into so many phases of the practice of medicine as to be a distinct menace to the stability of our organization.*"

"By the term 'contract practice' is meant the carrying out of an agreement between a physician or group of physicians as principals or agents and a corporation, organization or individuals for a definite sum or for a fixed rate per capita." "Contract practice, per se, is not an ethical question, ethics being with the form of the contract and the conditions under which it is made. Each case must be judged on its own merits after all the facts pertaining thereto are known."

A contract is unfair or unethical:

1. When the compensation received is inadequate, based on the usual fees paid for the same kind of service and class of people in the same country.
2. When the compensation is so low as to make it impossible for a competent service to be rendered.
3. When there is underbidding by physicians in order to secure the contract.
4. When a reasonable degree of free choice of physicians is denied those cared for in a community, where other competent physicians are readily available.
5. When there is solicitation of patients directly or indirectly.

MEMBERSHIP

The right of the county society to continue as the exclusive portal of entrance and enforced exit of the membership of the A. M. A. has been attacked in the last several sessions of the House of Delegates, and attempts made to change the Constitution and By-Laws, whereby the House, on the recommendation of the Judicial Council, should have the power to expel a member in case the state association and local society refused to do so. All these attempts have failed thus far. Notice has been given that the question of change will again be before the House at their 1928 session.

BASIC SCIENCE ACT

To promote the establishment of a single standard of professional knowledge and skill for all classes who assume to treat the sick, the Bureau of Legal Medicine and Legislation drafted a form for Basic Act along lines suggested by the acts passed in Wisconsin and Connecticut.

Basic Science Acts find their justification in the fact that knowledge of anatomy, physiology, chemistry, pathology, bacteriology and diagnosis is the basic of all rational attempts to heal the sick, no matter what method of healing may be employed, and that the sciences named are securely beyond the reach of the dogmas of any healing cult. Basic medical practice acts provide for the determining by nonsectarian, nonmedical examining boards the knowledge of the sciences named, possessed by the applicants who seek license to practice the healing art in any form. Applicants who demonstrate to the satisfaction of the basic science examining boards adequate training in such sciences are certified to the proper professional examining boards. Each professional board determines whether the applicants certified to have the preprofessional and professional education required of practitioners of the particular mode of healing represented by such board. Not until they have been found qualified by the basic science examining boards and the professional examining boards are the applicants licensed to practice the healing art in any form.

SHEPPARD-TOWNER MATERNITY ACT

On January 13, 1927, the United States Congress passed an act extending the law for two years, and providing that the law should be void at the expiration of the two-year period. The Sheppard-Towner Act will, therefore, expire on June 30, 1929. The Act itself was limited to five years and normally would have expired June 30, 1927. However, those charged with its administration proclaimed it to be permanent legislation and organized federal and state activities under it on the presumption that the Act would continue in force indefinitely. It was the fact that the service had been so arranged that it seemed necessary that two years' grace be allowed to permit the winding up of affairs.

MEDICAL EDUCATION

"Progress in medical schools consists chiefly in the enlargement of teaching plants, in securing better qualified teachers, and in the adoption of improved methods of instruction. The number of students enrolled have increased from 12,930 in 1919 to 18,840 in 1926, and to approximately 19,532 in the present session."

The supply of physicians in the United States is 133 for each 100,000 people, as compared with 92 in Great Britain, 77 in Switzerland, 73 in Japan, 35 in France and 28 in Sweden. The number of graduates of medical schools of the United States each year is gradually increasing. The number of graduates for this year will be approximately 4,000, only a slight increase over last year being anticipated. It is expected that for the next three or four years at least there will be larger increases in numbers of graduates.

"The present-day methods of combatting disease have been developed mostly in the last thirty years and include many highly technical procedures which require a high degree of skill for their successful use. In skilled hands these methods are saving thousands of lives, but if attempted by untrained or inexpert practitioners, they are highly dangerous and may have disastrous results.

"The tendency to specialization is due to the greatly increased knowledge of medicine and the multiplicity of highly technical methods of treatment. * * * The danger is not from specialization itself but from those who pose as specialists who have not secured the additional essential knowledge or skill in such specialties. *The present-day course of medical instruction leads directly to specialization.*"

The Reference Committee on Medical Education, to which the report of the Council on Medical Education was referred, refers to the above quotations in this wise: "The comments on specialization all have the purport of favoring it. No mention anywhere in the report is made of training or the necessity for training for any other practice. Has the Council abandoned its views of the necessity for training medical men for general practice? If so, we believe it should reconsider. In our judgment, the chief object of medical education should be the training of general practitioners. We believe, however, that there should be a brief course in the more important specialities in the undergraduate years, one sufficient to give an orientation of the important facts of these specialties, and that this could be provided by a drastic and intelligent reduction of the special courses. Preparation for actual practice of specialties should be altogether postgraduate and founded only on a sound general training, preferably in an internship."

BASIC TRAINED NURSE

A resolution of the House of Delegates at their session in Dallas, 1926, requested the Board of Trustees to appoint a committee on nurses and nursing education to investigate and report to the next House of Delegates on the nursing question, and especially on the question of increasing the number of bedside nurses throughout the several states.

The House also at this session adopted the resolution, "That there is great need throughout the country for a basic trained nurse, and that all pupils or student nurses shall receive basic training in training schools connected with hospitals giving courses of two years. The curriculum should provide bedside instruction, class room lectures and demonstrations, and above all the teaching of the art of nursing by precept and example so as to fit the pupils or students for their work as nurses in the hospitals and in the homes. Graduates, after passing the state examination, should be registered as trained or, if preferred, registered nurses. Such registered nurses may become public health or other specially designated nurses after being properly admitted to postgraduate schools for nurses and passing the required examination."

The Committee on Nurses and Nursing Education, appointed by the Board of Trustees as per request of House of Delegates at the Dallas session, submitted a very comprehensive study of the nursing question in the United States, Canada and Europe, with comparative data, which makes very instructive and interesting reading for those interested in the subject, and the nursing question is of vital interest to all medical men. The Committee's recommendation touching the training course is, "That the period of training be twenty-eight months, the first four months to be devoted to concentrated study of fundamental anatomy, bacteriology, physiology, chemistry, and dietetics, and that the succeeding two years be devoted as far as possible to teaching the art of nursing by demonstration, participation and practice."

The Reference Committee, to whom the above committee report was referred, recommended to the House, "The acceptance and filing of the report of the Committee on Nurses and Nursing Education; that the A. M. A. give earnest support in the work of the Committee on the Grading of Nursing Schools and share in the financial program of the work to the extent of $5,000 a year for a period of five years, unless the work should be completed before that time." The reference committee was convinced that, "The many fundamental weaknesses in the present training program for nurses and the economic difficulties under which graduate nurses are working, cannot be corrected until a more exhaustive review of the field has been completed."

The recommendations of the Reference Committee was adopted by the House.

EIGHTEENTH AMENDMENT

The Supreme Court of the United States. by a vote of five to four, refused the appeal of Dr. Lambert, which appeal was directed at the principle of Congress regulating the practice of medicine by limiting the right of the physician to prescribe one pint of whiskey to a patient in ten days.

The House declared its adherence to the principle that legislative bodies composed of laymen should not enact restrictive laws, regulating the administration of any therapeutic agent by physicians legally qualified to practice medicine. A supplementary report of the Judicial Council was also adopted, recommending that "Every resolution relating to the alcohol question shall be referred to the Board of Trustees for investigation."

HEROIN

The Board of Trustees were requested to have the Council on Pharmacy and Chemistry make another investigation of the use of heroin, in conjunction with some of the scientific sections.

PUBLICITY

On recommendation of the Judicial Council, articles of an educational nature on medical or health subjects, intended for the lay press or audience, should give expression to the consensus of opinion of the profession rather than to personal views; and the articles preferably to appear under auspices of the A. M. A. or of a county or state society.

STANDARDS FOR SURGEONS

The following is an excerpt from the address of the speaker of the House of Delegates:

"* * * What are or shall be the qualifications and requirements for a man to be classified as a capable, competent surgeon? * * * There is evidence of ill-advised, poor and unskilled surgical work being done by undertrained or incompetent men. Hospital Boards in smaller hospitals are not in control of the situation and the public will suffer, unless we institute measures by which to formulate standards that may be employed. * * * Has not the time, then, arrived and are we not obligated, as America's highest authority, to whom the public rightly appeals for guidance and advice, to solve this one momentous question as to the requirements, qualifications and standards that are basic and essential that one may hold forth as being a capable, dependable, properly trained surgeon and to formulate a means whereby the public may make such identifications? Sincerely, therefore, does your Speaker recommend and urge that by proper action you authorize the appointment of a Committee of Seven, to whom this question shall be referred with instructions that a preliminary report be submitted at our next annual session."

The report of the Reference Committee, and which report was adopted by the House, "commends the Speaker's reference to the duty of the A. M. A. to standardize and to elevate the practice of medicine and surgery within and without hospitals through efforts of our own association but not through legislative or other agencies. This desirable result may be accomplished through already existing committees, and the appointment of another committee might well result in duplication of effort."

The above excerpt from the Speaker's address, to those who profess noting a tendency and desire of an element in the profession to bring about a regulation, whereby "boards" will determine when a surgeon is "capable and properly trained" to operate in standardized hospitals, may be cited as substantiation of their belief. However, the adoption of the Reference Committee report, recommending "standardizing the practice of medicine and surgery (whatever it may connote in this connection) through efforts of our own Association but not through legislative or other agencies," may be calculated to reassure the critical minded. But, again, "this desirable result may be accomplished through already existing committees," does not clarify the nebulosity to some of us, as to whether we "sat" on the Speaker's recommendation or endorsed it.

George R. Proctor, M. D.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Poliomyelitis, With Especial Reference to Treatment. By W. Russell MacAusland, M.D. Surgeon-in-Chief, Orthopedic Department, Carney Hospital, Boston, Massachusetts. 173 Engravings. Cloth. 402 pp. $5.50. Lea & Febiger, Philadelphia, 1927.

In the preface to this book the author states that he has tried to write a comprehensive treatise, particularly concerning the principles of (orthopedic) treatment, and that he has read a "tremendous number of publications extending over a twenty year period" in its preparation. Poliomyelitis was first described by Underwood in England in 1793. Flexner and Noguchi first discovered the supposed etiologic organism in 1913 and found it to conform to Koch's requirements. Their work, however, has not been generally corroborated by others. Outbreaks of poliomyelitis have been prevalent in this country since 1907, with greatest incidence in Massachusetts and New York in the beginning, but since spreading all over the United States until 1916, when there was a general epidemic throughout the land and 13,000 cases in New York. It is a summer disease but many more cases occur from December to May than are generally recognized.

Only about 2 per cent of children are susceptible and in 4 per cent of afflicted families is there more than one case. Fourteen days appears to be the most probable incubation period. The means of transmission are questionable but flies and infected milk are known carriers, besides human contacts with the disease. Following the usual routes of transportation, yet poliomyelitis is found more often in remote rural regions than other infections. Quarantine is remarkably effective in stopping the disease in thickly settled districts. The specific organisms enter the body chiefly from the nasopharynx, following the sheaths of the olfactory nerves and from thence entering the lymphatics and cerebrospinal fluid. Infection may be general without involvement of the nervous system as seen in abortive cases. The author leans more to the globoid bodies of Flexner than to the pleomorphic streptococci of Rosenow as the etiologic organisms but does not consider the matter settled.

Classifications are given of the various types of poliomyelitis which make the diagnosis so delightfully difficult at times. The symptomatology is described in great detail. A common sign is said to be a glazed sclera and cornea, unfamiliar to us. Paralysis is seldom seen after the eighth day of the disease, more often occurring from the second to the fourth day. The fever may last a week or several weeks. In a case recently seen by the reviewer with characteristic symptoms and a spinal fluid cell count of 350, the fever continued for over a week without any resulting paralysis. In noting the polioencephalitis type the author says that the two diseases often coexist in the same patient. This would seem a statement difficult to verify. The interesting but rare involvement of the cerebral or upper neuron is described with mono- or hemiplegia of spastic variety. The author states that poliomyelitis may be excluded in diagnosis when the spinal fluid is normal. A child died recently at a local hospital under the reviewer's observation of the encephalitic type of poliomyelitis confirmed by autopsy, in whom there were no pathologic changes in the spinal fluid. This seems not surprising as similar findings sometimes occur in meningitis.

In respect to treatment the serum of recovered patients and Rosenow's serum are chiefly discussed. The former the author rather prefers but certainly it is very difficult and usually impossible to obtain and is weak compared to the hyperimmune horse serum. The statistics are also far and away in favor of the Rosenow serum. Dr. Draper, the exponent of serum from recovered patients, could not decide definitely whether the serum was of certain value in some 45 preparalytic cases, whereas in 60 preparalytic cases treated with Rosenow's serum not one developed paralysis, and in 61 cases with slight paralysis all recovered completely, except one patient. The reviewer has used Rosenow's serum in many preparalytic cases without observing a case of paralysis and in slight cases with immediate recovery. Until many thousand cases have been treated with a like number of controls a positive decision can not be arrived at in this matter.

The greater part of this book is devoted to the surgical orthopedic care of the paralyzed patient and every known sort of weakness and deformity resulting receives the most careful and detailed discussion as to the various types of treatment appropriate. During recent years no diseases have presented more interesting problems than poliomyelitis and encephalitis. We have lately reviewed two books on encephalitis and now we have the pleasure of noticing this admirable work on poliomyelitis which is without doubt a most timely publication. It is in fact the most concise, complete and comprehensive authoritative treatise on poliomyelitis in English. The book reflects credit alike on its distinguished author and through him on the medical profession.

WINSLOW.

APPLIED BIOCHEMISTRY. By Withrow Morse, Ph.D., Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadelphia, Second Edition, Revised and Reset with the cooperation of Joseph M. Looney, M.D., Assistant Professor of Physiological Chemistry, Jefferson Medical College. 988 pages with 272 illustrations. Philadelphia and London: W. B. Saunders Company, 1927. Cloth, $7.00 net.

The fact that a new edition is called for in less than two years after the publication of the first edition indicates both the popularity of the book and the advance that is taking place in biochemistry. The laboratory exercises are included in the text, and the book seems to be thoroughly practical, despite the fact that the author quotes from the English chemist J. S. Thorpe the following: "In the not far distant future the whole subject of biochemistry, which is the chemistry of life, will form but a part of organic chemistry, and we shall be able to apply to it the means and methods which have been attended with such astounding success during the past sixty years in the treatment of the parent science. When this is the case, the causes of our bodily ills will be as clear as the structure of indigo; and their removal as easy as a test tube reaction. The treatment of disease wil lbe as sure and as certain as the neutralization of ammonia by sulphuric acid." The author indicates that he thinks Thorpe's statement is not extravagant.

There are a large number of footnotes, in which interesting historical facts, references to the literature and definitions are given. In order to enable the student to visualize the men who are contributing to the advance of biochemistry, many of their portraits are distributed through the pages of the book.

Among the chapters there is an interesting one on man and his environment,, one on body maintenance, and chapters on energy producers and structure producers. There are also chapters on the chemistry of common foods and the digestion and absorption of foods. The chapter on vitamins is adequate. The book is thoroughly up to date and can be recommended to the practitioner as well as to the student.

GRISWOLD.

DISEASES OF THE MOUTH. By Dr. Sterling V. Meade, D. D. S. Professor of Oral Surgery and Diseases of the Mouth, Georgetown Dental School, Professor of Diseases of the Mouth, Georgetown Medical School, Washington, D. C. Two hundred and seventy-four Original Illustrations in Text and twenty-nine full page color plates. 578 pp. $10.00. The C. V. Mosby Co., St. Louis, 1927.

This book is a complete and comprehensive review of the literature on diseases of the mouth. The author gives references at the close of each chapter and quotes from over five hundred writers. The radiograms are some of the best that have been given us to date and he has a goodly number illustrating his work. The color plates are quite inferior to the illustrations in the book and are of very little value from a diagnostic point of view.

The chapter on stomatitis is quite extensive and peculiar as to his classifications, describing seventy-five different types of stomatitis. The chapter on disorders of enamel, dentine and cementum could be much clearer on the question of mottled enamel, hypoplasia due to interference of nutrition at the time of calcification and the deformed Hutchinson's tooth of the inherited syphilitic. These types are often confused by dentists and physicians.

In the treatment of leucoplakia the author gives nothing as to the value of radium, recommending surgical and electrothermic removal. The closing chapter on oral sepsis and systemic disturbances is well summarized in a paragraph by the author: "There is need for a closer cooperation of the medical and dental professions in handling the problem of the effects of oral sepsis upon the general health of the patient."

MARTIN.

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SUPERINTENDENT
1420 Spring Street, Seattle, Wash.

An Introduction to Clinical Perimetry. H. M. Traquair, M.D., F.R.C.S., etc.; Assistant Ophthalmic Surgeon, Royal Infirmary, Edinburgh, etc. 164 Illustrations. Cloth. 264 pp. $13.50. The C. V. Mosby Co., St. Louis, 1927.

Although the title modestly states that this is an introduction to clinical perimetry, it is really a very comprehensive work. The methods of taking the fields are described but the various devices are not all given in detail, as the author properly claims that the simpler the method the more perimetry will be employed by the oculist. He prefers a large campimeter of black velvet cloth 2 meters high and 2½ meters wide with the patient seated 2 meters away. The interpretation of the findings is explained and the various conditions which produce alterations in the field are discussed.

In his introduction to the American edition of this work, Wiener states that in his visits to the offices of many of his colleagues he notices the perimeter in some out of the way corner, covered with dust and sometimes there is total absence of a perimeter. Almost any oculist will admit that he should do more perimetry not only for diagnosis but also for the information it affords him concerning the progress of a case. The physician who possesses this book is certain to have his interest in the subject of perimetry stimulated with resulting benefit to his patients and himself. Brugman.

Neoplastic Diseases. A Treatise on Tumors. By James Ewing, M.D., Sc.D., Professor of Pathology at Cornell University Medical College, New York City, Third Edition, Revised and Enlarged. Octavo of 1127 pages with 546 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth $14.00 net.

This volume presents many features of special interest. The Codman registry of bone sarcoma has been the basis for rewriting the section on bone tumors, while the classification of breast tumors has been simplified to correspond more closely with clinical varieties. The chapter on brain tumors has been rewritten, due to the recent work in that field and the newer nomenclature has been partly adopted. Practically the world over Dr. Ewing's book is used as an authority to determine the type of tumor. Padding is absent. It is a volume of solid value. Much new material has been added, particularly relating to both practical and theoretical matters. Some of the references to the literature in the previous editions, it is "believed," have been corrected. About sixty new illustrations—gross, microscopic and radiographic—have been added. Mosiman.

Prenatal and Maternal Care. By W. E. Hunter, A. B., M. D., F. A. C. S., Department of Obstetrics and Gynecology Inter-Mountain Clinic. 229 pp. J. W. Stacy, Inc., San Francisco, 1927.

The author states this book has been written for the expectant mother who is anxious to know something about the physiology and hygiene of pregnancy. No attempt is made to cover the field of obstetrics in detail, but to supply facts and information that the busy physician is unable to give. There is a brief description of the anatomy and physiology of the pelvis, uterus, ovaries and menstruation. The essential facts of embryology are briefly and intelligently discussed. The popular misconception of maternal impressions is disclosed as a delusion and correct information is imparted. In hygiene of pregnancy the expectant mother is given much information, which should be imparted to every woman. Sufficient facts regarding childbirth are presented, but unnecessary details are avoided. The mother is wisely advised to ignore advice of friends and neighbors regarding bringing up her baby, which information she should obtain from her physicians. This is a volume which any physician can safely recommend to the expectant mother.

The Medical Clinics of North America. (Issued serially, one number every other month.) Volume XI, Number III (Tulane University Number, November, 1927.) Octavo of 210 pages with 46 illustrations. Per Clinic Year, July, 1927, to May, 1928. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London. W. B. Saunders Company, 1927.

This volume is representative of the medical profession of New Orleans. The clinical reports cover a variety of well-known diseases, as measles, scarlet fever, pleurisy and pneumonia. Some unusual conditions are discussed as macular lesions of leprosy by Hopkins and Denney, abundantly illustrated with helpful suggestions for diagnosis. While bubonic plague is rare in the United States, Mendelson discusses many features of this disease, illustrated by two cases treated at New Orleans. One will find many interesting features in this volume.

Tuberculosis of Hip. Among 208 cases treated for tuberculosis of the hip there were forty-six in which evidence was lacking of there ever having been a tuberculous infection. The following conditions were included in those cases: chronic arthritis, four; suppurative arthritis, four; coxa plana, five; congenital dislocation, one; epiphyseal displacement, two; incomplete sacralization of the fifth lumbar vertebra, with symptoms referred to the hip, two. These cases constitute 22 per cent of the entire series. No hip, or in fact any other joint, is now treated for tuberculosis until the diagnosis has been proved either by aspiration and guinea-pig inoculation or by exploratory operation. One hundred and fifty patients were followed by Alan DeForest Smith and Win H. Watters, New York (*Journal A. M. A.*, Jan. 21, 1928), for more than three years. One of the most important facts brought out is that thirty-six of these 150 patients, or 24 per cent, died. Twenty-four deaths were caused by some form of tuberculosis: tuberculous meningitis, ten; pulmonary tuberculosis, five; extensive suppuration of the hip, four; amyloidosis, two; miliary tuberculosis, two; tuberculous peritonitis, one. Six died from some cause other than tuberculosis, and in six cases the cause is unknown. The patients who were still living at the time of the last report numbered 114, or 76 per cent of the number followed for three years or more. Seventy-one cases, or 47 per cent, still were active. Judged by clinical examination, only two patients were inactive with a useful range of motion. Forty-one patients, or 27 per cent, were quiescent, with varying degrees of deformity and with markedly limited motion or no motion.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

GASTRIC ULCER *

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ROCHESTER, MINN.

In looking back over the development of our knowledge of gastric ulcer, many interesting phases may be noted. One of the early descriptions of the pathology of gastric ulcer was presented by Baillie about 1790, and the symptoms with certain clinical features were recorded by Abercrombie about thirty years later. Much has been published on the subject since then; nevertheless the problems incident to the diagnosis and treatment of gastric ulcer are apparently far from settled.

In spite of the fact that most that is known of the pathology of ulcers was obtained from necropsy material, yet until recent years it was not known that many of the ulcers called gastric were in the duodenum and not in the stomach. When this was realized it was soon found by statistical study of cases in which operation was performed that the incidence of ulcer in the duodenum was much greater than in the stomach; about 7:1. Ulcers occur in the stomach and duodenum at the same time in about 3.5 per cent of the cases.

Because of certain similarities between gastric and duodenal ulcers there has been a tendency recently to consider them in one group and many articles have appeared under the heading of gastroduodenal ulcers. This seems to me to be a mistake because in spite of certain likenesses gastric and duodenal ulcers present other characteristics which make them entirely different.

From a clinical viewpoint both gastric and duodenal ulcers occur more frequently in men than in women, the ratio being 3:1. The age incidence in the sexes is the same. The symptoms in gastric ulcer are not so definite and regular in relation to meals as in duodenal ulcer. In the relief of pain from taking food or alkalies they are similar but with gastric ulcer the pain is more intense or vague, and is not so frequently described as distressing. The site of pain is not as definite.

From a pathologic standpoint gastric and duodenal ulcers must be considered as entirely different. The gastric lesion is a true ulcer in that the mucous membrane is destroyed and the tissue reaction results in a certain amount of fibrous and scar tissue which forms the walls for the crater of the ulcer. There is usually some associated inflammation in the surrounding tissues. Much attention is now being paid to the inflammation and gastritis around these ulcers in an effort to demonstrate the possibility of inflammation being the prime factor in the etiology of the ulcer. Such studies, particularly in European clinics, have been instituted since the advent of subtotal gastrectomy in the treatment of these lesions. In many instances in which the

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* Read before the Sixth Annual Meeting of Pacific Northwest Medical Association, Boise, Idaho, June 27-29, 1927.

greater part of the stomach had been removed for a small gastric ulcer, it has been shown that the inflammation in the wall, particularly at the lesser curvature, may extend for some distance toward the cardia and also toward the pylorus. Whether this inflammatory reaction is the cause or the result of the ulcer is a problem creating much interest at the present time.

Nearly all ulcers of the stomach occur on the posterior aspect of the lesser curvature and in the central part of the stomach. A definite proportion are on the cardiac side of the median line. Formerly we heard much of the pyloric ulcer, the inference being that the ulcer was within the pylorus. As a matter of fact, pyloric ulcers almost never occur; they are either gastric or they are duodenal. If they are gastric, there is usually, at least, about 3 cm. of healthy mucous membrane between the ulcer and the pylorus.

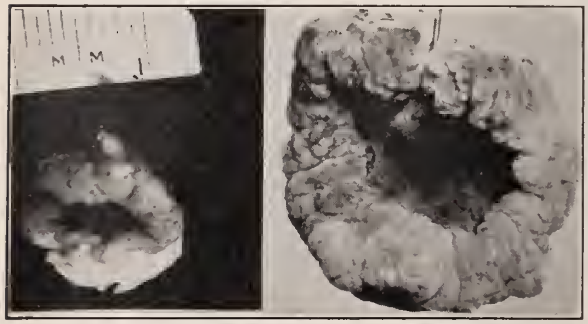

a b

Fig. 1. Comparison, a, carcinomatous ulcer of the stomach, b, simple ulcer of the stomach.

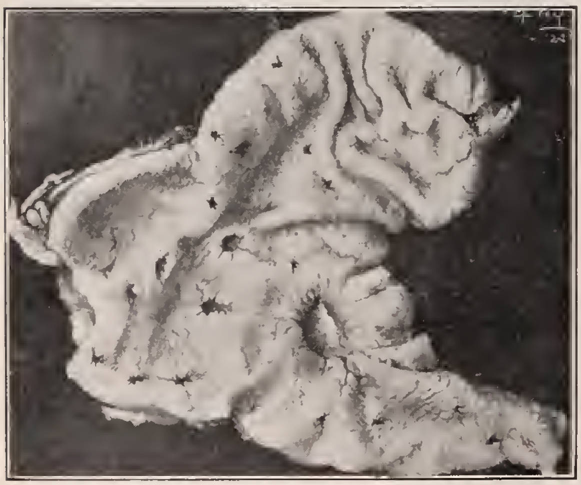


Fig. 2. Multiple gastric ulcers.

One of the principal reasons for considering ulcer of the stomach and ulcer of the duodenum separately is the pathologic picture. It may be stated that ulcers of the duodenum are all simple ulcers or inflammatory processes and in none is the question of malignancy concerned (fig. 1). Because of this, duodenal ulcers may be treated as benign lesions and any conservative method that offers a prospect of relief is justifiable. On the other hand, ulcers of the stomach may be benign or they may be malignant. So far as is known, there is no absolute way of distinguishing a malignant ulcer of the stomach in its early stages from one that is not malignant except by histologic study. We have endeavored by clinical studies, roentgen-ray examination and a consideration of the size and situation of the ulcer to establish a plan by which its nature could be recognized, but so far we have not been successful. At the present time it must be said that there are no physical differences between small malignant ulcer and benign ulcer except the cellular structure, so that a microscopic study is necessary before the exact pathologic nature of the ulcer can be determined. It seems to me that the point to keep constantly in mind in recommending treatment is the inability to recognize with certainty the particular kind of ulcer present in a given case (fig. 2).

Much controversy has arisen concerning the frequency with which benign ulcers become malignant and the proportion of cancers that develop from benign lesions. Certain observers feel that a malignant ulcer is primarily a malignant lesion and yet from the long-standing history of ulcer in certain malignant cases there is some reason to doubt this. There are other areas in the body in which benign ulcers do become malignant, such as the lip, the buccal mucosa following leukoplakia and the skin following burns.

INCIDENCE OF GASTRIC AND DUODENAL ULCER AS PROVED BY OPERATION 1920 TO 1926

Year	Duodenal ulcer cases	Gastric ulcer cases	Proportion of duodenal to gastric ulcer
1920	642	143	4.49 to 1
1921	490	102	4.80 to 1
1922	582	98	5.93 to 1
1923	691	116	5.95 to 1
1924	720	117	6.15 to 1
1925	845	111	7.61 to 1
1926	817	124	6.58 to 1

In a review of all cases in which ulcer was resected in the Clinic it has been found that a definite percentage showed evidence sufficient to warrant a histologic diagnosis of cancer-on-ulcer. This question as to the percentage of gastric ulcers becoming carcinomatous should be of academic interest because of the lack of any method of determining the benign from the malignant except by most careful microscopic study. Even after such study pathologists often disagree because of different interpretations. In all probability it will always be difficult to decide whether the malignant ulcer originated as such or whether there was a period in its early existence when it did not manifest any of the present known signs of malignancy. According to MacCarty the question of whether carcinoma develops in chronic ulcer cannot be answered because no positive or negative facts regarding the development can be ascertained in the study of simple or carcinomatous gastric ulcer. No one has produced gastric ulcer experimentally and then produced carcinoma in that ulcer.

In a consideration of the clinical aspects of gastric ulcer it is realized that in many respects the symptoms are similar to those of duodenal ulcer. There are some differences, however. Graham says "the regular gastric type, as we prefer to consider it, has the same periodicity and the same group symptoms, though not so clearly cut as in the duodenal lesion, but as we have shown in at least one-fourth of the cases the difference is quite indistinguishable. Pain or distress comes sooner after meals, does not continue so clearly to the next meal, may cease for a time to begin again before the following meal, and is often eased by food though not so often nor so clearly as the pain of duodenal ulcer. Fear of food pain is more often noted. Food in small amounts gives ease, while in larger amounts it gives pain. Hunger pain is not so clear cut, and not so frequent, because the pain may pass before meal time arrives. Careful diet seems to give more relief than in duodenal ulcer, unless complications are present. Some food is not so troublesome in the high as in the low ulcer, and the position of the body as well as physical activity plays a more important ease rôle in the gastric than in the duodenal cases. A definite intrinsic gastric complaint runs throughout the history, though the features seem less clear cut than in the duodenal ulcer and one feels a greater lack of certainty in the diagnosis." However, the fact remains that the final diagnostic figures in the series of cases which Graham reported held clearly as well in the gastric as in the duodenal types.

Histories of high-lying ulcers show an early tendency to an irregular type of complaint. Pain is the one constant clinical diagnostic factor in all peptic ulcers. Pain at night is much more common in duodenal ulcer than in gastric ulcer. Radiation of the pain to the left is suggestive of gastric ulcer. The pain comes on earlier after the ingestion of food. In gastric ulcer a small amount of food frequently gives ease, while larger amounts produce immediate pain.

Eusterman has called attention to the fact that it is sometimes possible to get a suggestion as to the nature of the ulcer from the clinical history. He noted that 7.5 per cent of the cases of inoperable cancer presented histories characteristic of benign ulcer before clinically malignant symptoms supervened. This percentage increased to 52 in the cases of malignant ulcer. The average duration of symptoms characteristic of benign ulcer was eleven years. Eight per cent of carcinomatous ulcers occur in patients less than forty years of age. It is reasonable to infer, from experience, that if the ulcer is shown by roentgen ray as a circumscribed lesion and subacidity or anacidity has occasionally been present, the ulcer will prove to be malignant.

In a consideration of the treatment of gastric ulcer, the most important phase naturally has to do with the pathologic nature of the ulcer. Many benign ulcers have undoubtedly healed spontaneously and many have been encouraged to heal by regulation of the diet and routine ulcer management. In many cases, in which the ulcer has disappeared according to repeated roentgen-ray examinations, it was found at operation. Undoubtedly a certain proportion of malignant ulcers favorable for operation have been carried to an inoperable state by being treated medically on the assumption that they were benign. It would appear that the clinician who treats gastric ulcers nonsurgically must feel the responsibility of almost a continuous observation of the case over a period of several years.

The results of radical surgery for cancer of the

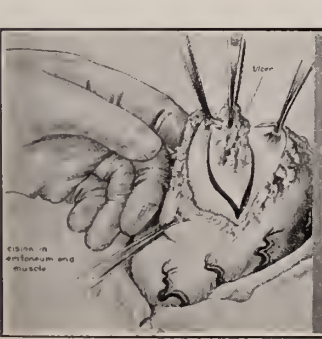


Fig. 3. Technic.

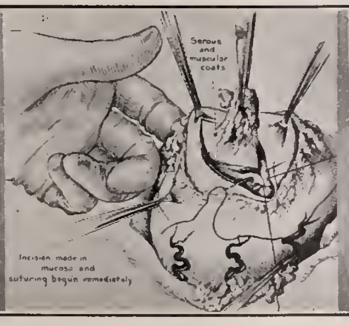
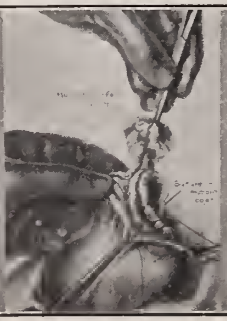

Serous and muscular coats
Incision made in mucosa and suturing begun immediately

Fig. 4. Technic.



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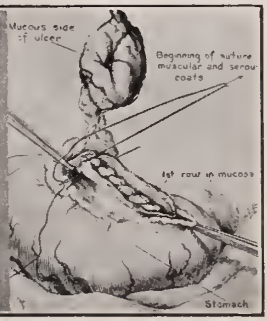

Fig. 6. Technic.

stomach depend largely on early operation. The poor results of the reported series up to the present time have largely been due to the fact that many of the operations were incomplete or were performed as a palliation in the face of distant metastasis or too extensive local involvement. I believe that all ulcers of the stomach should be treated surgically, at least until some means is developed whereby we can distinguish the benign lesion from the malignant. The operation must include thorough removal of the lesion and reestablishment of the gastric continuity (figs. 3 to 6).

Gastroenterostomy cures only a small proportion of benign gastric ulcers. Excision of the ulcer alone leaves a poorly functioning stomach in more than a third of the cases, and complete inability of the stomach to empty in others. Thus far our best results have been obtained by wide excision of the gastric ulcer on the lesser curvature and gastroenterostomy. This procedure has been one of the most satisfactory for gastric cases. In a very few instances the ulcer has recurred but to my knowledge the stomatal or jejunal ulcer has not occurred, following excision of simple gastric ulcer and gastroenterostomy.

We are just passing through the period of subtotal gastrectomy for ulcer. This operation was based largely on physiologic principles and, like other surgical procedures founded on such principles, it is doomed to fail. Subtotal gastrectomy for large ulcer of the stomach, whether it is benign or malignant, is often indicated because it is the best technical procedure. Pylorectomy is often the best procedure, if the ulcer is near the pylorus. If malignancy is suspected, the lesion should be widely removed.

The results of the surgical treatment of gastric ulcer have been good since the different steps in the operation have been more carefully carried out. The stomach, fortunately, has a large blood and nerve supply and heals readily, so that the immediate convalescence is usually satisfactory. The great hazard is pulmonary complications. Ultimately, the patient who has been operated on for gastric ulcer is restored to a normal condition without handicap.

In the series of cases of gastric ulcer reported here various features are illustrated.

REPORT OF CASES

Case 1. *Primary diagnosis of carcinoma not verified by complete histologic study.* A man came to the Clinic in December, 1922, complaining of epigastric pain of three years' duration. He had first noticed spells of pyrosis coming occasionally from three to five hours after meals and eased by food. One year after the onset the pyrosis developed into a dull epigastric pain coming on two hours after meals, most marked at the xiphoid and radiating through to the back. Food generally eased the after-meal pain as well as the night pain. Soda was also used to relieve symptoms. He had been in hospital on diet with some relief. During the last nine months he had been on a soft diet. Vomiting had occurred two and a half hours after meals every two or three days during the last month. Bleeding had not occurred. He had lost twenty-six pounds in weight in six months.

Examination. Epigastric masses could not be palpated. A fractional Ewald test meal showed a total acidity of 14, 10, 16 with no free hydrochloric acid or altered blood in 75 c.c. secretion. Roentgenograms showed a large perforating ulcer on the lesser curvature of the stomach and gastric retention graded 4. Clinical data indicated the presence of malignant ulcer.

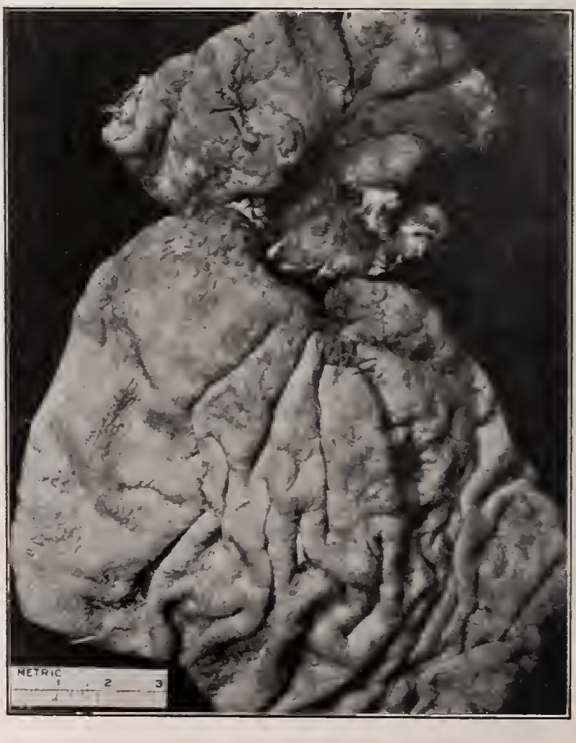

Fig. 7. Gross appearance of chronic gastric ulcer.

Operation. At operation a subacute perforating ulcer was found on the posterior wall of the stomach about 8 or 10 cm. above the pylorus. The perforation had occurred posteriorly onto the pancreas and the transverse colon. The lesion was 3 by 2 by 1.5 cm. Grossly it did not appear malignant. A sleeve resection was performed. The patient was free from symptoms for thirty months and gained thirty pounds.

Examination of tissue (fig. 7). The pathologists reported the presence of carcinoma. Lymphatic involvement was not found. Later pathologic study failed to show evidence of carcinoma in any of the many sections taken from various points in the edge of the ulcer. Cross section showed that the muscle in the base of the ulcer had been destroyed and the edges were tilted upward toward the mucosa. The scar tissue of the base appeared to be dense; there was no evidence of malignancy.

Case 2. Primary diagnosis of simple gastric ulcer; microscopic picture simulated carcinoma. A man aged forty-six years came to the Clinic for examination in February, 1924. For twenty years he had had attacks of indigestion usually with belching after meals after indiscretions in diet. His father had died from cancer of the stomach. The first attack lasted three weeks and was relieved by a soft, bland diet; subsequent attacks lasted from one to two days and had not come on with any regularity. January 1, 1924, after a "drinking bout" a sudden attack of severe epigastric pain was followed by residual soreness. After the attack had subsided the pain came on three or four hours after meals, and was only partially relieved by a soft diet and soda. His appetite remained good, although he belched a great deal after meals, and frequently induced vomiting for relief. He had lost strength and about twenty pounds in weight.

Examination. There was no palpable mass in the abdomen. The hemoglobin was 78 per cent; leukocytes numbered 14,700. The blood Wassermann test was negative. The Ewald test meal showed total acidity 44 and free hydrochloric acid 30, in 110 c.c. secretion which was free from blood. Roentgenograms revealed a perforating gastric ulcer necessitating surgical treatment.

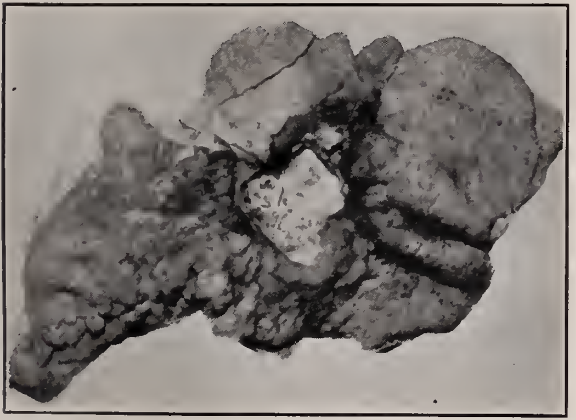

Fig. 8. Gross appearance of subacute ulcer.

Operation. At operation an ulcer 2.3 by 2 cm. was found on the lesser curvature at the juncture of the upper and middle thirds of the stomach. The lymph nodes were enlarged along the lesser curvature up to the cardia. A diagnosis of malignant ulcer was made and a Polya operation performed. The patient was living when last heard from, twenty-two months after the operation; at that time he had been free from all symptoms for four months and was gaining strength.

Examination of tissue. Figure 8 shows the gross appearance of the ulcer at the time of the operation. There was a marked hemorrhagic zone around the crater. A study of cross sections revealed a rather recent perforating ulcer with a definite hemorrhagic area beneath the mucous membrane of each edge and along the base. The fibrous tissue in the base showed many newly formed fibroblasts, as found in rather new granulating tissue. The appearance of the lesion on cross section, because of the recent perforation, simulated that of perforating ulcerating carcinoma. Given time, the muscularis would gradually have turned upward by pressure from the proliferative fibrous-tissue base, as well as the later contraction of this base after the ulcer had become chronic. Evidence of malignancy could not be found in any of the many sections studied. Many large plasma cells were scattered throughout the base and both edges which, under the highest magnification, closely resembled malignant cells, but were considered part of the active regenerative hyperplasia in the base and edges of the ulcer. Many young fibroblasts were also seen.

Comment. This case presented several interesting features. The duration of the symptoms for twenty years was at first suggestive of chronic peptic ulcer but, aside from the one attack twenty years before examination, typical symptoms did not exist until after the probable perforation one month previously. The appearance of the cross sections is in accord with this, as well as the cellular changes noted. The hemorrhagic appearance of the ulcer was also suggestive of active ulcer. The mistaking of individual cells found in regenerative hyperplasia for malignant cells has been emphasized by many pathologists, and frequently they cannot be differentiated with the same degree of accuracy as in the more mature tissue.

Case 3. Primary diagnosis of benign lesion; secondary diagnosis of highly malignant carcinoma. A man aged thirty years came to the Clinic April 9, 1924, complaining of having had trouble with his stomach for two years. For about a year he had noticed a sense of fullness and bloating which occasionally came on immediately after meals; belching of gas afforded relief. The pain was not severe. He had not noticed food ease. In the spring of 1923 he began to vomit occasionally; this relieved him. Attacks were preceded by epigastric pain. He also noticed a crampy type of epigastric pain after meals, radiating through to the back, and associated with regurgitation of small quantities of food. He was placed in hospital and given powders and a milk diet; this relieved him for a time. About ten days prior to his examination vomiting recommenced. He had lost twenty-five pounds in weight.

Examination. A small mass was palpable in the epigastric region. The hemoglobin was 88 per cent, the erythrocytes numbered 5,680,000 and the leukocytes 7,800. The Ewald test meal showed a total acidity of 80, free hydrochloric acid 48 in 100 c.c. secretion. The roentgenogram revealed a lesion at the outlet of the stomach with obstruction apparently on the gastric side. The clinicians made a tentative diagnosis of benign pyloric obstruction but could not exclude the possibility of lymphosarcoma on account of the age of the patient.

Operation. A subacute perforating lesion 1 cm. in diameter was found immediately above the pylorus on the posterior wall, causing marked obstruction. The exact nature of the ulcer was questionable and a posterior Polya resection was performed. There was no evidence of lymphatic involvement. Seventeen months after the operation when the patient was last heard from symptoms had recurred.

Examination of tissue. Grossly, the ulcer simulated chronic gastric ulcer. The outline was round, the crater deep, and the edges slightly overhanging. Study of cross sections revealed an undifferentiated type of carcinoma in the base and in both edges. In the center of the base the muscularis was destroyed and replaced with carcinomatous tissue containing fibrous tissue. The plane of the broken edge of the muscularis was level with the remainder of the muscle. The malignancy was graded 4.

Comment. This case illustrates how impossible it is to make an accurate diagnosis from the gross appearance or feel of the lesion. The operator on inspection and palpation believed the lesion to be benign but it proved to be a highly malignant carcinoma. The importance of radical operation in cases of questionable gastric ulcer rather than an indirect type of operation such as a gastroenterostomy is clearly demonstrated in this case.

Case 4. History of symptoms over a long period. Benign ulcers becoming malignant, or malignant ulcer originally but of the slow-growing type. A man aged forty-eight years came to the Clinic because of intermittent epigastric distress of fifteen years duration, the attacks coming on twice each year. The pain with the stomach empty was eased by food or soda. For two months prior to examination symptoms had increased and coffee ground vomitus had appeared.

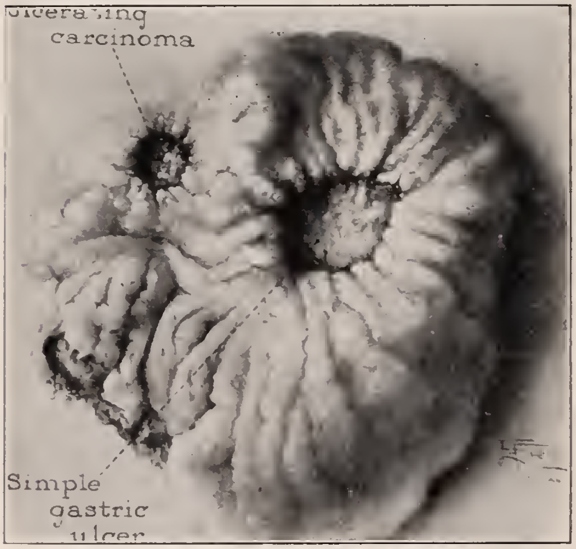

Fig. 9. Gross appearance of lesions.

Examination. A mass could not be palpated in the epigastrium. The hemoglobin was 75 per cent, and erythrocytes numbered 4,920,000. The test meal showed total acids 68, free hydrochloric acid 32, in 100 c.c. secretion, containing altered blood and meat and vegetable fibers. Roentgenograms showed a large gastric ulcer on the lesser curvature.

Operation. An ulcer 2 cm. in diameter was found on the lesser curvature 2 cm. from the pylorus, and a second ulcer 3 cm. in diameter was found 6 cm. from the pylorus of the lesesr curvature (fig. 9).

Examination of tissue. The pathologist reported that the pyloric lymph node showed carcinoma but that those along the lesser curvature did not. Some free fluid was present in the abdomen, but gross metastatic lesions could not be demonstrated. The ulcer nearest the pylorus was round and flat, the mucous membrane ending abruptly in its normal thickness without induration of the edges or overhanging edges. Transverse sections through the ulcer showed carcinoma cells along both edges and small areas of carcinoma cells in the base; the muscularis was intact. There was no fibrous tissue reaction. The ulcer 3 cm. in diameter appeared to be chronic and calloused, with overhanging mucous membrane edges and deep ulceration. A transverse section of this ulcer showed considerable scarring of the base with the muscularis fragmented and reduced by fibrous tissue. The lesion was evidently of long duration. The carcinoma showed about a 25 per cent tendency toward acinus formation and was graded 3. A Balfour-Polya resection was performed. Death occurred ten months later from recurring carcinoma of the stomach and liver.

Comment. This case illustrates the difficulty of attempting to evaluate the chronologic order of events from the history or from gross pathologic data. The diagnosis of cancer-on-ulcer was first made from a sector of the edges of the ulcer and the base extending from the edges to the center of the ulcer. Carcinoma was not found in the base. However, when the transverse section was cut the true nature of the life history of the ulcerative lesion was determined, since carcinoma was found near the center of the base of the ulcer. There was no scar-tissue formation and the muscularis was found to be intact beneath the base of the ulcer. The chronic simple ulcer gave microscopic evidence of age without evidence of healing. The destruction of the gastric wall was responsible for the long ulcer type of history. The relatively high grade malignancy without apparent reaction of the tissue accounts in part for the rapid postoperative decline.

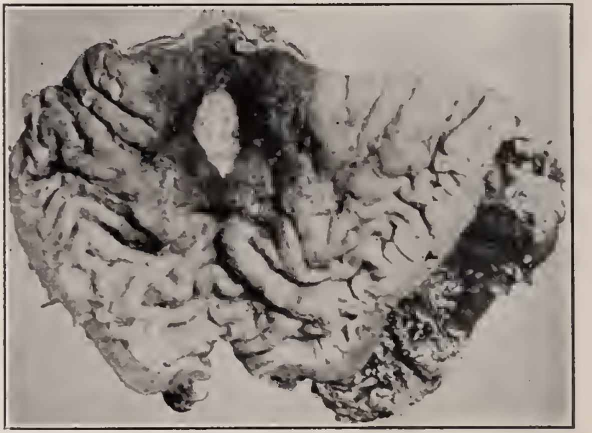

Fig. 10. Gross appearance of ulcer in which cancer developed secondarily.

Case 5. Clinical and microscopic data suggestive of carcinoma developing on an ulcer. A man aged sixty-seven years came to the Clinic September 16, 1924, complaining of stomach trouble of one year's duration. During the summer of 1923 epigastric pain had appeared daily between 10 and 12 a.m. for two weeks, during which time he had noticed food and alkali ease. Six months prior to his visit to the Clinic he had had another spell which was relieved by a course of medication. For the last year he had had pain in the left upper quadrant of the abdomen which seemed to be brought on by exercise and was relieved when he was lying down. A week before examination spells of vertigo, syncope and vomiting of blood-streaked material appeared. Although his appetite had been good, he had lost fifteen pounds in weight.

Examination. A tumor was not palpated. The hemoglobin was 59 per cent, the erythrocytes numbered 3,360,000 and the leukocytes 10,400. A diagnosis of operable gastric carcinoma was made from the roentgenograms. Clinical data were suggestive of carcinoma of the stomach without obstruction.

Operation. A gastric lesion 3 cm. in diameter was found near the pylorus with an area of induration extending for 2 cm. beyond the ulcer crater. A Billroth I type of resection was performed. There were no signs of lymphatic involvement. The patient was a poor cardiac risk and the operation was performed under local anesthesia. He died from pulmonary complications.

Examination of tissue. Figure 10 shows the gross appearance of the ulcer. A cross section through the crater showed carcinoma cells in one edge only, the base and opposite edge being free. Sector sections near the area showing carcinoma likewise showed carcinoma in the edge, but none in the base. The muscularis of the base was completely destroyed and tilted upward slightly toward the mucosa but not so markedly as is usually seen.

Comment. There is still a slight element of doubt as to the proper disposition of the case but because of the data obtained from the available specimen it must be classified with cases of carcinoma on ulcer. The malignancy was graded 2. The history obtainable was relatively short but this would not exclude the presence of a previously healed or latent ulcer which did not cause symptoms until perforation occurred about a year previous to examination.

Case 6. Carcinoma graded 2. A history of symptoms of fifteen years duration. A man aged fifty-seven years came to the Clinic August 29, 1924, complaining of stomach trouble of ten years' duration, consisting of irregular spells of indigestion lasting one or two days each week. For the last three years he had noted gnawing, burning pain two or three hours after meals, which was eased by food, and belching gas. He had not tried soda for relief. There was no history of vomiting, hemorrhage or loss of weight.

Examination. Abdominal mass was not palpable. The hemoglobin was 78 per cent; the erythrocytes numbered 4,450,000 and the leukocytes 7,400. The Ewald test meal showed total acidity of 50, free hydrochloric acid 32, in 90 c.c. secretion. Roentgenogram revealed a perforated gastric lesion of the lesser curvature, believed by the clinicians to be uncomplicated gastric ulcer.

Operation. A perforating ulcer, protected by omentum, was found on the lesser curvature of the thick-walled stomach, about 2.5 cm. from the pylorus. The ulcer was 1.8 cm. in diameter by 8 mm. deep. It was excised, the incisions being carried through the pylorus and the closure made as a pyloroplasty. Appendectomy and cholecystectomy were performed two weeks later. The patient was living and free from symptoms twenty months after operation.

Examination of tissue. On gross inspection the ulcer appeared to be of a typical chronic variety with slightly rolled-in edges. Cross sections and sector sections showed definite destruction of the muscularis in the center of the base with the ends of the muscularis tilted upward. Considerable scar tissue was present in the base. Carcinoma could be demonstrated in one edge of the ulcer only, but was fairly well differentiated and was graded 2.

Comment. The histologic studies of the ulcer warrant a diagnosis of carcinoma-on-ulcer, since carcinoma was found in one edge only and none in the base. This also agrees with the long-standing history of an ulcer type of dyspepsia. The presence of the chronic cholecystitis complicated the ulcer history given by the patient but this disease may have been merely incidental to the chronic gastric ulcer.

Case 7. A short history characteristic of peptic ulcer: carcinoma graded 3 was found. A man aged fifty-four came to the Clinic in September, 1924, complaining of stomach trouble of one year's duration. His mother had died from "tumor" and one of his daughters had been operated on for gastric tumor. During the autumn of the year before he had noted slight epigastric distress when his stomach was empty and found that this was eased by food and soda. He had no trouble during the winter but there was a recurrence for several weeks during the spring. This had subsided but again appeared several weeks before he presented himself for the examination. He had not been nauseated nor had he vomited. The distress occurred daily during attacks and was always relieved by food and soda. He had not lost weight.

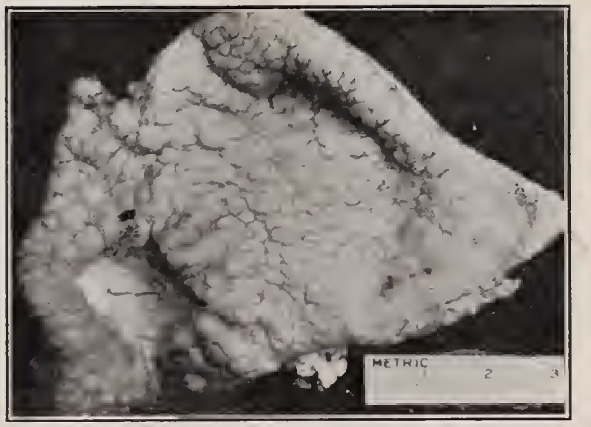

Fig. 11. Gross appearance of early ulcerating carcinoma.

Examination. Abdominal tumor was not palpated. The hemoglobin was 76 per cent, the leukocytes numbered 7,400. The Ewald test meal showed a total acidity of 52 and free hydrochloric acid 30 in 100 c.c. secretion. The first roentgenogram of the stomach showed nothing abnormal but another made two days later revealed a small lesion on the lesser curvature just above the angle. The clinicians diagnosed the lesion operable benign gastric ulcer.

Operation. An ulcer 2 cm. in diameter was found on the lesser curvature and posterior wall of the stomach 7.5 cm. above the pylorus. The surgeon suspected malignancy because of the thickness of the tissue. A Billroth I resection of the pyloric end of the stomach was performed. The patient was last heard from twenty months after operation at which time symptoms had not recurred.

Examination of tissue. Sector sections showed evidence of carcinoma in the edge only; the base was free. A later cross section was made and carcinoma found in both edges and base. The muscularis of the base was intact through the ulcer. The degree of differentiation was low. The carcinoma was graded 3. Lymphatic involvement was not found (fig. 11).

Comment. The short history in this case with periodicity of symptoms, the typical day-by-day sequence of symptoms during the attack, symptomless remissions, and the specific methods of relief by food and soda, characteristic of peptic ulcer, gave the medical consultants no clue as to the possibility of malignancy. However, the age of the patient, the short history and the fact that malignancy could not be ruled out except by the pathologists, made operation the treatment of choice, and it was justified. This patient heeded the danger signal of an organic lesion of the stomach. The responsibility of excluding malignancy of an abdominal viscus in patients, whose symptoms begin after thirty-five years of age, rests on the clinician. In this instance, medical treatment would have resulted disastrously, whereas by surgical exploration early malignancy was detected, and resection gave the patient an excellent chance for a cure.

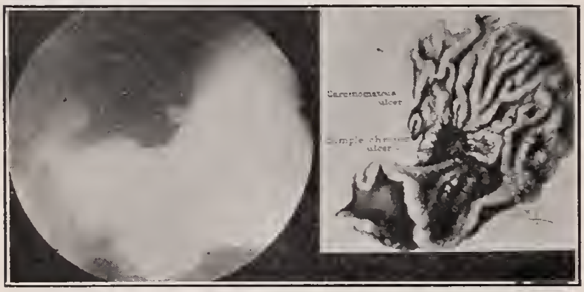

Fig. 12. Ulcer and ulcerating carcinoma, graded 4, ten months' history.

Case 8. Simple ulcer of the stomach associated with highly malignant carcinoma. Symptoms of short duration. A man aged sixty-two years came to the Clinic because of severe epigastric pain of sudden onset ten months previously, requiring morphine for relief. His mother had died from cancer of the stomach at the age of seventy-six years. Two months after the first attack a similar attack occurred which lasted longer. Since then he had been having pain two to four hours after meals, associated with nausea and vomiting of food. Soda and food eased the distress temporarily.

Examination. An epigastric mass was not demonstrable. The hemoglobin was estimated as 76 per cent. Roentgenograms showed a gastric lesion on the lesser curvature of the stomach.

Operation. A large perforated gastric lesion was found on the posterior wall of the stomach close to the lesser curvature, and a smaller ulceration about 2 cm. from this. A Balfour-Polya resection with enteroanastomosis was performed. The patient died ten months later from recurrent carcinoma of the stomach (fig. 12).

Examination of tissue. Grossly both ulcers appeared to be benign and chronic. Cross sections through the lesions showed the perforating type of ulcer with muscularis tilted upward and the base filled with scar tissue; the edges and base were free from carcinoma. Although the smaller lesion appeared to be a simple ulcer, the edges were more irregular. Cross section showed that the muscularis of the base was intact, although infiltrated in places with carcinomatous cells. There was only a slight tendency toward differentiation into acini. Malignancy graded 4 was diagnosed.

Comment. The gastric complaint in this case began ten months prior to operation and was suggestive of a perforative type of lesion. The only perforation found was in the simple ulcer. Investigation of the specimen showed that the smaller ulcer was definitely an ulcerating carcinoma. This case is similar to case 4 except that the simple ulcer in this instance persisted for a long time. The high grade of the malignancy is manifested in the death of the patient from recurring carcinoma ten months after operation or twenty months from the onset of symptoms, even though the patient was in advanced years and more resistant to rapid neoplastic invasion.

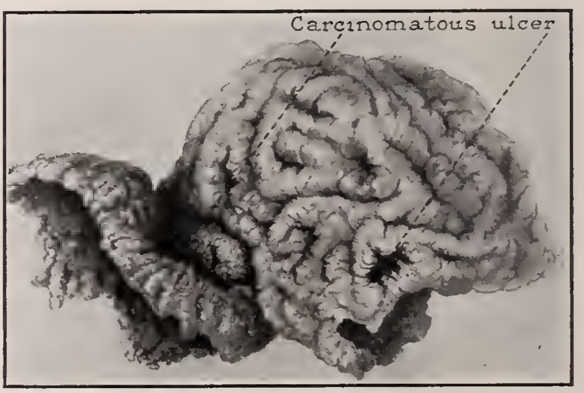

Fig. 13. Two separate ulcerating carcinomas, graded 3. Symptoms for eighteen months following an attack of influenza.

Case 9. Two distinctly separate ulcerating carcinomas graded 3: Symptoms of eighteen months' duration following an attack of influenza. A man, aged sixty-one years, came to the Clinic complaining of gastric symptoms that had begun with an attack of infleunza eighteen months previously. Pyrosis and anorexia had existed since the onset, the former becoming gradually more pronounced, especially with the stomach empty. Vomiting had begun two weeks before examination.

Examination. A mass was palpable in the right epigastrium. The gastric analysis showed a total acidity of 40; there was no free hydrochloric acid or occult blood. Roentgenograms showed carcinoma of the stomach with obstruction.

Operation. An ulcerating lesion was found close to the pylorus. A posterior Polya resection was performed. The patient was living and without symptoms thirty-three months after operation (fig. 13).

Examination of tissue. The gross specimen presented two ulcerating lesions, 2.5 cm. and 6 mm. in diameter, respectively. Sector and cross sections of both ulcers showed the muscularis layer to be intact and the bases as well as both edges involved with carcinoma. The muscularis of the larger ulcer was replaced by malignant tissue in places, while the smaller ulcer proved to be early ulcerating carcinoma, in which the mucosa had just begun to slough. There was still a part of each layer of mucous membrane intact. The base, however, was free from malignant growth. Both carcinomas showed little tendency to differentiate. Malignancy was graded 3; lymphatic involvement was not found.

Comment. This case presented two ulcerating lesions of the stomach of the same grade of malignancy, and yet independent of each other as regards continuity of malignant tissue. The onset following "influenza" is characteristic of a number of cases studied; this has been noted in several large series. This leads to the conjecture as to whether beginning malignancy causes symptoms from lowered body resistance or whether the influenza so frequently mentioned may be the undiagnosed general malaise and fever that would accompany beginning ulceration of a malignant lesion. At the onset of a phlegmon in any other part of the body, in which there is rich lymphatic drainage, malaise and pyrexia is often present until resistance becomes established; usually a diagnosis is made because of the local visible inflammatory lesion. Lesions involving the gastric wall only would not cause localizing signs unless the peritoneum adjacent were secondarily involved or, if there was epigastric tenderness, it would be of the same nature as that incident to subacute perforation of the stomach. The malignancy of these lesions was relatively localized, as evidenced by the fact that there was no lymphatic involvement. Even with the higher grade of malignancy radical resection would offer a good chance of a five year cure.

DIAGNOSIS OF GASTRIC AND DUODENAL DISEASE *

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There are so many important organs and so many vital physiologic processes located in the upper abdomen, and the material and immaterial relationship of these organs to each other and to more remote organs is so intimate that we find here our biggest problems in diagnosis. Both our training and our obligation demand that we narrow down a diagnostic conclusion to a specific disease and that we should be able to write down a diagnosis that will stand. We have learned dogmatic syndromes and have been taught to think in terms of specific disease. This is as it should be, and we all know the power and the lasting value of the dogmatic teacher, yet I am going to devote most of my discussion on the diagnosis of uppper abdominal conditions to a clinical experience that tends to show that syndromes are unreliable, hasty diagnoses dangerous and a true diagnosis oftentimes obtainable only by exploratory operation.

Moynihan very dogmatically says that, when a patient presents recurring attacks of pain, vomiting and hemorrhage, when the pain comes on more than two hours after meals with absolute time accuracy for a given quality of meal, and persists until more food is taken, the patient has duodenal ulcer. He says, further, that when the pain comes on less than two hours after a meal and the rhythm of gastric pain is food, comfort, pain, comfort instead of food, comfort, pain, the patient has gastric ulcer. Finally he says that in duodenal ulcer, "it is not necessary to the attaining of an accurate diagnosis that an examination of the patient be made; the anamnesis is everything, the physical examination is relatively nothing."

It would be a presupmtion to question the statements of an authority so preeminent. I am certain that his statements are correct insofar as they apply to a majority of uncomplicated ulcers and feel that the profession is under lasting obligation to this eminent surgeon, yet far too many of my patients do not meet the rigid requirements of these syndromes and have a much more elaborate and complicated symptomatology. Abdominal cases come to us, as a rule, complaining of "stomach trouble" and we are at once confronted with a differential diagnosis that involves a very long list of abdominal diseases. If each one of these classified diseases had a positive syndrome entity and occurred separately, this list would not be so formidable, but as a matter of fact a large majority of the symptoms that are described for any one of these diseases is found in all of the rest, and it is a well known fact that any two or three diseases may exist coincidentally. I have had a lot of trouble in determining the true source of a given symptom and have made a clinical study of a long list of patients with a view to finding some one source for the symptoms that are common to all abdominal diseases.

The pathology of the duodenum has occupied my attention for about four years and I have worked through a series of perhaps two hundred and fifty cases at Cushman Hospital, together with Dr. George Pfeiffer, on the hypothesis that pain, gas, distention, a sense of fullness, loss of appetite, local sensitiveness (excepting acute inflammation), nausea and vomiting, dizziness and general weakness are duodenal symptoms. I feel fairly certain as a result of this study, that, with some exceptions, gallbladder, ulcer, appendix and adhesion cases have symptoms in direct proportion to the degree in which adhesions, contiguous pathology or nerve reflex impairs the duodenum. I have concluded, further, that the completeness of recovery after operation for these conditions depends largely upon the degree in which it has been possible to restore the duodenum to an adhesion-free mobility, and that the patient who is operated upon for gallbladder disease and ulcer with adhesions or with an associated chronic appendicitis without taking care of this pathology does not get rid of this group of symptoms that we call duodenal.

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* Read before North Pacific Surgical Society, Victoria, B. C., Dec. 3, 1927.

A private patient of my associate, Dr. Nelsen, illustrates this point very well.

Mrs. E. C., 28, had suffered for ten years or more with distress and gas in the right upper quadrant, which came on immediately after meals. She had indigestion, with gas, ate very little solid food, had to keep the stool liquid to be comfortable and was awakened at night by distress in the bowels. Eight years ago she had a pelvic operation and at the same time her gallbladder was drained through a button hole incision. Her digestive symptoms continued. Last August she was seen by Dr. Nelsen. A Graham-Cole study showed a long, narrow fingerlike gallbladder that was functioning well. At operation the gallbladder was thin-walled and emptied easily but was buried in adhesions and the duodenum was badly crippled by adhesions. The gallbladder was removed, a careful peritoneal plastic operation was done on the duodenum, and the patient is now well.

We feel quite certain that any disease in the right upper quadrant that forms adhesions to the duodenum disturbs its function, and that the symptom expression of this disturbance is pain, gas distention, a sense of fullness, loss of appetite, local sensitiveness, nausea and vomiting, dizziness and general weakness. If this conclusion is correct, then we should sometimes get the same group of symptoms when the duodenal wall is not mechanically damaged, and I shall relate two cases to illustrate this phase of the study.

Mrs. B. presented symptoms of extreme pain in the epigastrium, vomiting, gas after meals, dizziness, a diet reduced to fluids and great loss of weight. An x-ray study showed a marked condition of right sided ptosis but no evidence of gallbladder, ulcer or stomach pathology. The duodenum was large and the barium was visibly and forcibly churned back and forth in the duodenum four or five times before it was passed on. The diagnosis was ptosis but the symptoms were duodenal.

Case 5171, age 51, came to the hospital with a diagnosis of duodenal ulcer. He had had recurrent attacks of epigastric pain, gas and vomiting since 1898, and these attacks were becoming more frequent. He had a feeling of distention and gas shortly after eating, severe pain, nausea and vomiting two hours after meals, loss of appetite and constipation. He had marked sensitiveness at the tip of the ensiform and some sensitiveness over the appendix. The radiogram showed an ulcer deformity of the duodenal cap, a kinked appendix, a normally functioning stomach and a normal gallbladder. There was hyperacidity.

All of this man's symptoms were distinctly located in the right upper quadrant and had to do with gastric and duodenal digestion, yet at operation the upper abdomen was found to be entirely normal, there was no duodenal ulcer and a diseased, kinked appendix was the only gross pathology found in the abdomen. Six months after operation he had not had a single symptom of his old trouble and was well. I have interpreted this case as one of duodenal spasm and disturbed duodenal digestion, the duodenal sympathetic nerve plexus having been stimulated by a closely related sympathetic plexus in the cecum.

Both of these cases, and I could list many others, related most of the symptoms that have been mentioned as duodenal, presented a difficult diagnostic problem in ruling out ulcer and cholecystitis, and may be looked upon as giving a purely duodenal group of symptoms. If this hypothesis can be proven and it can be shown that pathology in any part of the abdomen is prone to express itself largely through the duodenum, much will have been done to clarify our thinking about symptoms referable to the right upper quadrant of the abdomen.

Moynihan is undoubtedly correct in giving to pain a place of major prominence in the diagnosis of ulcer of the duodenum and ulcer of the stomach. When this pathology is uncomplicated and the pain rhythm is present in association with a long history, vomiting and hematemesis, we have the most impressive and accurate syndrome of medicine, but there are so many patients in my experience who do not give this syndrome that I am inclined to believe that an overdependence upon it has greatly befogged the diagnosis of gastric and duodenal disease.

Rehfuss says that "in gastric ulcer, of all organic conditions, there is no pathognomonic group of findings capable of definitely fixing the diagnosis." Bloch states in a paper on the differential diagnosis of duodenal ulcer and gallbladder disease that sometimes "nothing short of an exploratory operation will clarify the diagnosis." Heyd discusses the mimicry of gastroduodenal ulceration by a diseased appendix and Gray shows in a recent article that the duodenal ulcer complex can be produced by tobacco smoking, gallbladder disease, vagotonia, neuroses, chronic appendicitis and a number of other conditions.

I get a lot of comfort out of these statements because so many of my patients come to me without a Moynihan label. The pain symptom is not always sufficiently clear in my experience to give it localizing significance and I do not expect it to give more than collateral assistance in diagnoses, when I know from the history that a patient has a complex pathology in the right upper quadrant. Nor do I see how pain can have a very positive diagnostic value in the light of Pyle's dictum that "visceral pain has a definite relationship to visceral function and expresses perverted activity rather than structural disease."

Case 6302 had a well defined, active duodenal ulcer, many duodenal adhesions to the gallbladder and liver and a well marked chronic appendicitis. He never had had the "food, comfort, pain" rhythm. He had more or less pain all of the time. After taking food, his pain would be relieved somewhat for a few minutes but never for more than an hour; then the same old grinding pain would continue. Persistent pain, distress and tenderness in the right upper quadrant were his chief complaints and along with these symptoms he had gas, indigestion, weakness and a loss of weight.

This is an average picture for a majority of the ulcer patients that I see at Cushman Hospital, but the pain story varies greatly.

Case 3644 sometimes had a sharp pain when hungry and was relieved by eating, but did not have pain at any given time after eating, and for the most part his symptoms were nervousness after eating, dizziness and weakness.

Case 4252, duodenal ulcer. Chief complaint is a lump in the pit of the stomach and a sharp pain when he gets up and moves around. This pain is all through the abdomen, eases up when he lies down and a pain in the left groin is the last to yield. He has pain in the lungs occasionally. Thirty minutes after eating the pain is greatest in the stomach.

Case 5370, duodenal ulcer, was admitted as an emergency with intense persistent pain in the epigastrium. An immediate operation was done because perforation was suspected, yet his ulcer looked no different from any other well marked ulcer and no real reason was found for the acuteness of the pain. It is a noteworthy fact that five weeks after the gastroenterostomy the total acidity was 86 and free HCl 70.

Physical examination does not give me much direct help in the diagnosis of gastric and duodenal disease unless there is a palpable tumor and most patients do not have any palpable evidence of disease. I always want to make a very careful palpation of the abdomen for the establishment of even negative findings, however. Some coincident or collateral pathology may be found. Then I believe that I think through the history and give it better application to the individual when I have my hands on the patient. Tenderness is unreliable. Muscle rigidity is somewhat more reliable.

Gastric acidity, as we observe it, has not been helpful. We make one or two observations of total acidity and free hydrochloric acid before operation and consider a total acidity of 50 and an HCl acidity of 30 as normal. In a very short series of cases that were tabulated, appendicitis showed variation from total acidity 10 and HCl 0 to total acidity 84 and HCl 64. Cholecystitis showed three cases with a total acidity below 10 and HCl absent, and a high record of total acidity 64 and HCl 50. A case of duodenal stasis showed a total acidity of 10 and HCl 6 at one observation and a few days later a total acidity of 72 and HCl 56. Duodenal ulcer showed a uniform hyperacidity. In four cases of gastric cancer one showed total acidity 60, HCl 50, one total acidity 50, HCl 16, and two total acidity 10, HCl 0.

Smithies says that gastric chemistry plays a comparatively insignificant role both in production and in the delay of ulcer healing.

I must refer to focal infection in its relationship to diagnosis. A great many patients with disabling stomach trouble are referred to the surgical department who cannot be accurately diagnosed until their focal infections have been cured. Last year we collected 67 cases that had been sent to the medical service for this management; only 12 of these cases came back for operation. Fifty-five were cured of their stomach trouble by clearing up their focal infections.

Constitutional psychopathic inferiority and "compensationitis" are big factors in a proper evaluation of gastric symptoms in the U. S. Veterans Bureau service and I find that the same is true of the neurasthenic that we treat in private practice. As a rule, it takes a lot of judgment to sift the chaff from the wheat in their story.

The sheet anchor in gastrointestinal diagnosis is the x-ray. This method of study has fallacies, shortcomings and misinterpretations, yet it is the only preoperative, diagnostic method of precision that we have and a negative finding has, as a rule, just as much value as a positive. I am free to admit that I do not accept an x-ray finding as final, if it does not fit into the history and my clinical estimate of the case, but I know that I have no right to diagnose or treat any upper abdominal case without the evidence that can be gained by an x-ray study.

I have recently had two very interesting experiences that illustrate both an almost unavoidable x-ray fallacy and the impossibility of making an accurate diagnosis in some cases. Both of the patients in question gave a good duodenal ulcer history extending over a long period, both gave an entirely clear duodenal cap deformity and in each case operation revealed a perfectly healed ulcer and a chronic appendicitis. It is a well known fact that the x-ray defect of ulcer of the stomach disappears promptly after an ulcer heals but that the cap deformity of duodenal ulcer persists for four or five years after the ulcer has healed. One of these patients was cured of his symptoms and the other has none of the old symptoms three weeks after operation.

SUMMARY

A brief summary of my conclusions regarding diagnosis of diseases of the stomach and duodenum would be:

1. A deliberate, thorough and thoughtful history stands in the position of first importance.

2. A competent x-ray study gives the only available and uniformly dependable physical evidence upon which a diagnosis can be based.

3. Some patients present a clear-cut, text-book syndrome which leaves little doubt about the accuracy of diagnosis.

4. Many cases of upper abdominal disease cannot be accurately and completely diagnosed without an exploratory operation.

5. There is good reason for believing that pathology in any part of the abdomen expresses itself through the duodenum and that a large group of symptoms which are common to many diseases may be properly classified as duodenal symptoms.

6. Localized pain and sensitiveness are unreliable as localizing symptoms and are not sufficient reason for concluding that an underlying organ requires an operation.

7. The pain rhythm of Moynihan is not generally applicable in gastric and duodenal ulcer.

8. Focal infection can produce profound gastroduodenal symptoms without organic pathology.

9. Hasty diagnosis is dangerous.

INTENSIVE POSTURAL REST IN TREATMENT OF PULMONARY TUBERCULOSIS. W. A. Kekler, and B. J. Weigel, Albuquerque, N. M., (*Journal A.M.A.*, Feb. 25, 1928) believe that in intensive postural rest as they use it they have a method of treatment of pulmonary phthisis that deserves to rank with pneumothorax and thoracoplasty in value and effectiveness. It is applicable in a wider range of cases. Complications are no more frequent and certainly less dangerous than with pneumothorax and thoracoplasty. When results are not obtained, pneumothorax or thoracoplasty may still be used. They see striking benefits, i. e., the maximum amount of healing possible in view of the nature and extent of the lesion in fully one-fourth of their cases, and in another fourth there is considerable improvement.

THE ADAPTION OF PHYSICAL THERAPY TO GENERAL MEDICINE *

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Physical therapy as recently rejuvenated and reclaimed embraces those physical agents whose energy is generated by an electric current. Of these modalities the ultraviolet or actinic energy, the radiant or visible light, the high frequency current, the sinusoidal current, and the galvanic current are the most extensively used. It is obvious that this is but one small branch of the physical therapeutic realm and is in the present discussion acknowledged as such.

The necessity for adaptation requires consideration of principles governing the activities of subjects to be adapted. Therapy in medicine today, even acknowledging many specifics and approach to near specifics as tremendous strides toward scientific exactness, still remains an art. And as an art it demands substantiating claims, being fortified by fundamentals in explanation of logical usage.

Underlying every use for a physical modality must be an urgent demand for a *thermal, a mechanical* or a *chemical* indication. All physical agencies, whether of electric origin or otherwise, owe any beneficial effect produced to generation of *heat,* to an actual mechanical activity or to a change in chemistry either local or general, or to a combination of one, two or all three.

Heat, applied within physiologic limits, creates a tissue reaction that is a biologic constant, the same under all conditions. The resultant effect-variation depends solely upon the type of tissue treated and its normal physiology. One would not expect to get the same results from heat application to a muscle as is effected when a gland is under heat stimulation.

Heat is sedative; it dilates the blood capillaries and determines a greater blood supply. A greater blood supply means more oxygen and oxidation, increases metabolism, changes chemistry, removes waste and accumulated products, as injury exudates, inflammatory products and carbon dioxide. Likewise nerve endings under the influence of heat are sedated, soothed and partially anesthetized.

Through the method of heat delivery administrations are of three types, conductive heat, convective heat and conversive heat. Conductive heat is surface heat administered by actual contact and beyond the contiguous tissues does not effect any change. The hot water bottle, electric pad, mustard plaster and the hot pack fall in this class. The convective type is heat delivered from some source other than at points of application, the electric globe, the sweat cabinet, hot air and the radiant light suggesting this variety. Note that in both types mentioned heat as created is heat administered.

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

In the conversive type of heat one energy potential undergoes a conversion into another form of energy through the medium of interposed tissue. An electric current of very high frequency is delivered through a proper hook up and passed. The resistance offered by the medium through which the current passes creates the heat which is produced by tissues resisting the invasion by an electric current. This is diathermy.

Without going deeply into the general effect of locally administered heat, as this is beyond the province of the present discussion, suffice it just to make the point for consideration. Body heat is maintained through a very delicate and close cooperation between a heat creation, a heat conduction, and a heat dissipation mechanism. A disturbance in any of the three precipitates an immediate demand for proper readjustment which is involuntarily and unconsciously made. Degree of disturbance determines the extent and necessity for adjustment and general constitutional reaction. Absorption of chemical by-products, as inflammatory exudates, carbon dioxide with circulation of these in the blood streams, sets up the necessity of general body activities and proper disposition of these blood increments. Thus the local treatment assumes the nature of constitutional importance. By far the majority of patients under treatment with diathermy fall asleep during the delivery of this heat, perhaps due to fatigue products or carbon dioxide together with nerve sedation.

The indication for the use of heat becomes a matter of selection, determining those pathologic and altered physiologic lesions which can be improved by physiology as set down. They comprise contusions, abrasions, effusion, congestions, local sedations and general peripheral circulatory dilatation as an aid to elimination, diaphoresis, and redistribution of blood supply.

Heat carried beyond physiologic limits becomes destructive by its desiccating effect on the tissues. This is surgical diathermy or coagulation. Any lesion requiring obliteration which lends itself to accessibility can be destroyed by this method. The advantage gained by coagulation over other means of extirpation lies in the sealing of the blood stream through coagulation, freedom from great after pain and healing by minimum scar formation.

The sinusoidal current is a modified galvanic current so delivered as to mechanically contract living tissue, particularly muscles. In a complete cycle of delivery two arcs are described, one within the positive phase of the current, the other within the negative phase and, since each is equally intensive, there is complete neutralization of the usual chemical reaction of this current. The name owes its origin to the fact that at any moment in either positive or negative arc phase a perpendicular line dropped from the arc to the abscissa would enable the sine of the angle thus made to be calculated.

But one reaction is produced and that is mechanical contraction. These contractions, by varying contact points in the producing machine, are made to be slow and rapid and are adjusted to meet the indication present. Stasis, nonuse atrophy, paresis, paralysis and atony suggest themselves as lesions to which this modality adapts itself. I know of no more startling results than those obtained by the use of the sine wave in atony of the large bowel which results in constipation, mechanical exercise of these muscles reestablishing the normal integrity, a reeducating and a rebuilding process. Muscles congested and stiff from nonuse after fractures and dislocation are hastened to resolution with a few graduated applications, and by contraction circulation enhanced and infection prevented.

The galvanic or direct current is a chemical current with polarity reaction. The flow of energy here is always in one direction, not reversible but constantly from the positive to the negative pole. By polarity reaction we mean chemical changes produced in tissues by virtue of properties inherent to polarity galvanic reaction. The positive pole increases oxygen, constricts the blood vessels, produces an acid medium, sedates the tissue and, if carried to a greater intensity, dehydrates and hardens. Practically the opposite changes occur at the negative pole. Hydrogen is increased, vessels are dilated, fluid becomes alkaline, irritation is set up and to a greater milliamperage liquification and softening occur.

To these properties are added ionization, the resolution of complex substances in the presence of water into more simple elements and the driving of these into the path pursued by the current, basic radicals seeking the negative, acid radicals preferring the positive pole. By using this property of ionization it is possible to obtain a combination of current chemistry, plus that of chemical solutions, each solution having a known affinity for one or the other poles. Copper, silver, zinc, practically all the so-called antiseptics used as topical applications can be forced into the tissues by the proper pole of the galvanic current.

Inoperable fibroid of the uterus with its accompanying hemorrhage has often responded to a positive pole galvanism. Endometritis, cervicitis and many inflammations of the generative tract owe a normal restoration to copper or silver ionization, and of late a simple otitis media of varying chronic durations startles the operator under zinc ionization. The sedative and oxidizing properties of the positive pole exhibit a great efficiency in acute congestive states, accompanying early inflammatory lesions. The thermal properties effected by the passage of the galvanic current, while not equal to that of diathermy, are nevertheless sufficiently potent to be given consideration and should not be entirely submerged to its chemical action.

Ultraviolet or actinic energy, the health or life sustaining energy generated and constantly discharged from the sun, so little known until recently, has during these past few years been assigned an importance in the general scheme of life, comparable only to the increasing knowledge of its necessity to the maintenance of health. While its creation is constant, the source of its generation is so distanced and the products of civilized industry as poured into the atmosphere are so many that the delivery of the pure actinic ray to the earth is so intercepted as to cause no little alarm among scientific investigators in this field. The actinic ray is so delicate as to perish and relinquish its identity in the presence of smoke and vitiated air; it cannot pass through ordinary window glass or dust accumulations, body secretions or clothing. The nude body must be exposed to it and the ray must be applied free from all impurities to be effective.

Accumulated knowledge emphasizes the fact that from November to March inclusive of the calendar year the air is so poor in actinic energy as to result in untold numbers of deficiency diseases. And were it not for the accumulated existence in nature's foodstuffs, stored there as "bottled sunshine" during the summer months, many would perish because of its lack. This energy is known as ultraviolet because of its position in the spectrum and actinic because of its chemic properties. It is definitely a chemical force, light rays with wave lengths in round numbers between 4000 and 2000 Angstrom units, Angstrom unit being an arbitrary measuring unit one ten-millionth of a millimeter in length.

The physiologic properties ascribed to its action owe their existence to different wave length action. The shorter wave lengths are irritant and bactericidal, the longer wave lengths are sedative and biologically active. Specifically the short waves are lethal to all forms of bacterial life, including spore form, graded time reactions proportionate to variety resistance determining the amount of energy required. Exposure of human tissue to the short wave results in the production of chemical nonbacterial inflammatory reaction, ranging from the mildest erythema to a blister. The longer waves, while capable of producing the same degree of nonbacterial inflammatory phenomenon, exert profound chemical and biological influence on general body metabolism. Recent experiments disclose facts to prove a stabilization of calcium and phosphorus metabolism, activation of cholesterol, energizing of vitamines, an ability to subsequently increase red cells after a temporary decrease and an intensification of some drug action.

Steinbock, through laboratory and practically applied experiments, has brought forth the startling information of the value of food activation, of the property to convert inactive food material into foods of potential health restoring qualities and by the same experiments determined the virtue of our tried and accepted cod-liver oil as due to stored actinic energy. The effects have gone so far as to demonstrate the vitamine value and sustaining food value of some animal food products to be dependent upon the stored actinic energy in the animal's food. The classical effect of ultraviolet energy in the treatment of rickets leaves nothing to be desired in the demonstration of its calcium and phosphorus stabilizing property. Recently the claim of European experimenters in the field of syphilis, to convert a Wasserman-fast blood to a negative blood through exposure to the actinic ray while under the classical treatment, has been substantiated by the writer.

Further adaption of physiologic properties to pathologic processes suggest themselves to the user of actinic ray energy and physical therapy as experience in clinical practice accumulates. The danger does not lie in use of the agents but in improper enthusiasm. Curtail and limit the use here, as with other known therapeutic agents, to fundamental and known facts and results will not be disappointing.

RELIEF OF PAIN *

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Pain is the symptom for which a large proportion of patients consult their physicians. For many people it exists as a spectre, constantly threatening with fear from injury or disease. In reality, however, pain is a beneficent provision of nature, whose presence provides the means of averting disaster which otherwise would soon result in destruction of the organism. It is the sentinel on the watch tower, ever prepared to signal the presence of an attacking foe and thus enabling means to be instituted for its expulsion and the preservation of the individual.

What is pain? Jelliffe says, "From a restricted philosophical view pain may be regarded as a reaction of the organism, in part or as a whole, to harmful influences, giving a warning in consciousness that some activity prejudicial to the health of the tissues is operative." Considered biologically, it is the record in consciousness at the sensori-motor level of the nervous system, of harmful contacts with reality, and warns the individual of such realities with the view of forcing a better adaptation. In brief, it is the reaction of the sensory nervous system to a prejudicial activity. These definitions will be amplified in the discussion which follows.

Speaking in general terms, pain is the result, first, of organic or physical agencies; second, it may ensue from consciousness connected with more complex processes. Thus the pain of fear, anxiety, dread, anger or other emotional conditions may be no less real pain than those of an irritated or injured sensory nerve. At this time we are not dealing with this latter type of pain.

There is a large group of cases where pain results from the pressure on sensory nerves by neoplasms in various parts of the body. Some of these, as cancerous growths, may progress to large size before their presence is indicated by painful sensations, as is known to every practitioner of medicine. Tumors or diseases of bone, of spinal cord or brain, likewise may be well advanced before their presence is recognized by local or referred pain, or certain physical disabilities. This class of cases, amenable to relief by surgical procedures, we are not at this time considering.

A very large number of patients afflicted with pain are the victims of infections or trauma. In both classes of cases similar pathology is observed, which may be illustrated in a case of commonly observed infection.

Infection may be exogenetic in its origin, where the invading organism is admitted through a lesion of the body surface, or it may result from a focus in a distant part of the body. In either case the same local phenomena are observed. The invading organisms multiply with prodigious rapidity in brief periods of time. Nature's attempt at repelling and suppression of the invaders is indicated by an increase of blood supply, accession of leucocytes and phagocytes, with accompanying exudate of serum. There follows swelling, induration and redness which commonly go under the name of inflammation. These phenomena represent nature's attempt to localize the invading organisms, and prevent their spread to other parts of the host with consequent destruction and death. The pain accompanying this process is due to the exudate into adjacent tissues, with the swelling and pressure upon terminal sensory nerve fibers.

The pain from trauma likewise is the result of some of the phenomena above described. Whether from direct external influence or caused by excessive muscular exertion, there follows local rupture of lymphatics and blood vessels, with exudates into adjacent soft tissue of serum and blood, whose presence causes pressure on sensory nerves with the resulting painful sensations.

Treatment of pain which we have under consideration can be successfully applied under two forms of therapy. The universal method for relief of pain is found through drugs, chiefly narcotics, whose effect is to blunt the sensorium so that painful sensations through sensory nerves are abolished. In some cases relief is thus permanently obtained through nature's correction of existing pathology during a sufficient period of cessation of pain thus secured. In a large majority of cases, however, the relief is temporary and its return may be expected when the drug effect has disappeared.

Indications for rational therapy are suggested, if we consider nature's method of relieving the pathologic conditions existing in conditions we are discussing. Nature's only means of removing inflammatory products is through the blood stream. The hyperemia, previously mentioned, excited by the presence of invading bacteria, is indicative of the increased blood flow, by which the inflammatory exudate is removed from the tissues in which it has been deposited.

Rational treatment will attempt the promotion and increase of this process, which is accomplished

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* Read before King County Medical Society, Seattle, Wash., Jan. 16, 1928.

by the agency of heat. This procedure is of universal knowledge and has been in vogue from time immemorial in the form of conductive heat, as represented by stupes, hot-water bag, electric pad, etc. This is the least effective method because of the comparatively moderate degree of heat which the surface of the body can tolerate from contact. Convective heat, obtained from a source of radiation, as illustrated in the therapeutic lamp, attains a much higher degree of temperature, soothing to the affected tissues and endured over a long period.

The most useful application available is conversive heat, as induced in the tissues themselves by their resistance to the passage of the high frequency current, commonly designated as diathermy. By the intelligent employment of this agency heat can be applied to the site of inflammation in any organ or tissue of the body. This therapy is applicable in all stages to inflamed tissues, promoting the absorption of exudates and thereby relieving the pain of which the patient complains.

After the acute stage of an infective process has passed, there commonly remains a condition of disability accompanied by pain of greater or less severity, resulting from the organized exudate which has not been removed from the tissues by the therapeutic measures usually employed. These patients often appear for treatment weeks or months after the subsidence of acute symptoms, the disability and pain being due chiefly to this exudate, accompanied by conditions of fibrosis and adhesions. The most troublesome of these classes of cases commonly involve the joints, where extreme disability often results.

In addition to the relief from proper application of diathermy and radiant heat as mentioned above, much benefit is obtained from use of the static current. The application of this current, characterized by high voltage and a minimum of amperage, induces cellular massage which mechanically expresses the exudate from the affected tissues into the circulation, thereby reducing the tension and relieving pain caused by pressure on sensory nerve fibers. This agency is effective in many cases when employed independently and in others obtains results in connection with diathermy. Its field of usefulness is extensive, being applicable to all forms of painful conditions accompanied by exudates, purulent conditions being excluded until the pus is evacuated.

The usefulness of massage in conditions under consideration is known to everyone. Following the application of diathermy, by which the tissues are softened, massage is found effective in promoting the absorption of exudates. A similar result is obtainable in suitable cases by the application of some of the sine waves from the sinusoidal machine. These induce rhythmic muscular contractions which aid in the process of absorption. In some cases one notes a decrease of pain, particularly acceptable to the patient. This is not of universal application, but employed with discretion, is a useful adjunct.

Mention should be made of the positive pole of the galvanic current as an agency for the relief of pain. It is a well known fact that the characteristics of the positive and negative poles of the galvanic current are diametrically opposed to one another. Among these qualities are the soothing and pain-relieving feature of the positive pole as contrasted with the irritation and often painful results from the negative pole. This analgesic effect from the positive pole is often utilized to relieve the pain of neuritis and some other painful conditions.

It must be understood that the procedures herewith described and recommended cannot be employed by rule of thumb. Successful results are secured by the intelligent and judicious applications of these methods which are ascertained through experience and treatment of cases.

The report of a few clinical cases will illustrate the principles under discussion.

Case 1. A boy of fifteen appeared for treatment a week after laceration of the left hand on barbed wire, with an infected wound near the ulnar border. The hand was swollen, indurated, red and hot to the touch. Red lymphatics extended above the elbow. Axillary glands were enlarged. He complained of pain in the hand and axillary glands. Treatment consisted of radiant heat for fifteen minutes on the dorsal and palmar surfaces of the infected hand. This was followed by diathermy, the fingers resting in a saline solution in which was placed the electrode from one terminal, the other being attached to the block tin electrode about the arm above the wrist, the application being continued for one-half hour. This treatment was applied morning and afternoon for two days. On the morning of the second day he stated the pain was greatly relieved in both hand and axilla. The treatment was continued for three more days, when symptoms had all disappeared and the hand was normal.

In this case the heat thus applied served two purposes. By helping to increase the local blood supply nature was aided in combatting the invading bacteria, as demonstrated by the presence of pus in the wound the second day of treatment. At the same time the process of absorbing the exudate was promoted, as witnessed by diminution of swelling and disappearance of induration.

In contrast to the rapid recovery of this patient, treated promptly during the acute stage of infection, the following case illustrates the long course of treatment often necessitated when applied after subsidence of the acute stage and in the presence of organized exudate.

Case 2. This man had the dorsum of the left hand punctured with a sliver two months previous to his appearance for treatment. Infection followed that required incisions with evacuation of pus and immobilization of the hand. Since the subsidence of acute symptoms he had experienced much pain in the hand, with complete disability. Examination showed the hand red, shiny, swollen and indurated. There was slight flexion of the fingers, with severe pain on forced flexion of any joints of the hand or fingers. Treatment already described was applied to this case. Radiant heat, diathermy and static were employed on hand and fingers. Progress was slow but constant. At the end of ten treatments swelling and induration had been relieved, and fingers could be flexed to touch the palm. This was followed by ten more treatments, after which the hand was sufficiently flexible to permit its use in work not requiring too tight a grasp. The hand should become normal after exercise in ordinary labor. If this case had been subjected to early treatment, like the preceding, a similar happy result could have been anticipated.

Cases of cervical adenitis are encountered from time to time accompanied with severe pain, which do not yield readily to the usual forms of treatment but may be amenable to methods herein described, as illustrated by the history of the following patient.

Case 3. B. M., aged 5 years, developed suppurative otitis media more than a month before being referred to me. About two weeks previously paracentesis gave free exit to pus. Cervical glands were infected, presenting a large, hard mass extending from the angle of the jaw to the clavicle, accompanied by constant pain, rigidity of head, and fever to 102°.

Previous treatment had consisted of various forms of hot applications, which had been ineffectual. Radiant heat was ordered from a therapeutic lamp at the greatest degree of heat tolerated by the patient. The mother was directed to use this continuously for hourly treatments by day, with two hour intermissions, and as much as possible at night. Relief from pain followed a few treatments. Areas of softening appeared in the mass, but no incision was attempted. At the end of ten days the induration was reduced to the size of a walnut, fever had subsided, there was free movement of the head, and the patient was practically in a normal condition.

As already described, these results were obtained from continuous hyperemia, by means of which the increased blood stream was enabled to counteract the infection and remove the exudates producing the painful induration.

The following case represents a group which have been treated with success and satisfaction:

Case 4. Mrs. S. appeared with infection at side of nail of two days duration, a beginning paronychia. There was swelling, induration, redness and continuous pain. The finger was given local treatment which had been used previously for many similar cases. Puncture above the nail failed to disclose pus. Next day the inflammation had extended with increase of symptoms, and the same treatment was applied. On the third day the infection had extended half way around the nail with increased severity of local conditions. Then the finger was treated with diathermy, by use of the nonvacuum glass electrode which conveys heat into the tissues beneath the skin. After an application of fifteen minutes pain was relieved. The following day the inflammatory signs were markedly reduced. She had suffered no pain since previous treatment which was repeated. The following day the finger presented a normal appearance.

In this case the invading organisms were overcome before the advent of suppuration, nature's efforts to this end being promoted by the treatment applied. A similar explanation is applicable to the absorption of the exudate and disappearance of swelling.

Case 5. S. C., a shipyard worker, was referred for treatment of acute subdeltoid bursitis of ten days duration, with no available etiology. He had received treatment without relief and surgery was contemplated. He was unable to abduct or raise the arm because of extremely acute pain above the head of the humerus. Even slight pressure over this area caused severe pain which was unremitting. Removal or putting on of clothes was a tedious process, requiring assistance. Pain at night was extreme and constant.

Treatment consisted of diathermy applied by mesh electrode on rubber sponge in axilla, connected with one terminal, the other being attached to block tin electrode over deltoid muscle. This was followed by static current applied by electrode over the deltoid, followed by static sparks. After two treatments the night pain was entirely relieved, there being little during the day, and the arm could be somewhat abducted. He received eight treatments during as many days, when pain was entirely gone and normal motions of the arm were restored. When last seen, three months later, there had been no return of the trouble.

The following case presented pathology similar to the preceding, of much longer duration, however. Its site I believe to have been quite unusual.

Case 6. H. S. was referred for injury of right shoulder. Seven months previously he fell thirty-five feet. No fractures were discovered about the shoulder but pain and disability had been continuous to this time. Most marked pain was located about the anterior surface of the head of the humerus, where there was an area very sensitive to pressure. Pain was continuous during the night, interfering with sleep. The location of his trouble seemed to be in the biceps muscle and particularly in the bursa of the long head, where it passes over the head of the humerus. This diagnosis was based on the following facts. With the arm extended at the elbow it could be raised with little difficulty and scarcely any pain, since the elevation was due to the contraction of the deltoid muscle. With the arm flexed at the elbow it could not be raised at all because of severe pain over the head of the humerus. This was due to the fact that, when the forearm was flexed, the biceps acted as well as the deltoid to raise the arm, thus contracting the fibers of this muscle. The pathology in this case was apparently a bursitis of the biceps bursa on the upper surface of the head of the humerus, between it and the long head of the biceps muscle.

The patient was very much depressed and melancholic on account of long disability. Treatment consisted of radiant heat applied to the front of the shoulder, diathermy with the electrodes applied anteroposteriorly over the affected area, as well as the technic described in the previous case, static and sinusoidal currents. He improved markedly after two or three treatments, and after eight treatments resumed light work. Since his discharge he has done manual labor, but on two occasions has returned with pain at the same site, being again relieved by the treatment and enabled to return to work.

Case 7. A pipe fitter called at the office one morning, stating that the right elbow had been injured the previous afternoon, although he could give no history of how it occurred. He had suffered such severe pain that he had been unable to sleep the previous night. The arm was fixed in slight flexion, any attempt at motion being extremely painful. About the olecranon was a large, tense swelling, painful to pressure in any attempt at manipulation. Treatment consisted of a half hour's exposure of the elbow to radiant heat, followed by static current in the form of sparks and brush discharge. The following morning he stated he had been free from pain and had slept well all night. He received three more treatments with entire cessation of pain, although some swelling remained and he had not yet entire freedom of motion. He insisted on returning to work and several weeks later informed me he had not missed a day.

Although this patient considered the inflammation to be in the joint, it was clearly a case of periarthritis, the joint itself not being involved. There was an exudate about the olecranon, whose pressure on sensory nerves caused the severe pain. The first treatment decreased this sufficiently to release the tension, thus relieving the extreme pain, and the swelling became less with each subsequent treatment.

Case 8. F. D. came for treatment, complaining of severe pain in right infraspinatus muscle, accompanied by severe paroxysmal attacks, the origin unknown. The difficulty had existed for three weeks over the region of the scapula, radiating thence to the shoulder and down the arm to elbow. All movements of arm were accompanied by pain. He could not dress without assistance. Sleep was difficult on account of wakening frequently with paroxysmal spasms. He was treated by diathermy through the infraspinatus muscle, the same being applied to the shoulder and arm. This was supplemented by the static current. After two or three treatments the relief of pain was marked and was entirely cured after eight treatments.

I have heard it stated that many cases diagnosed as neuritis, involving nerves of the arm, are in reality myositis of the supraspinatus or infraspinatus muscles, the pain in the nerves being caused by pressure on them from the exudate in the affected muscles. In such cases primary treatment is advised to be directed toward the affected muscle.

Relief from pain in the chest as well as abdominal organs is obtainable in many cases by radiant heat and the application of diathermy. I have treated a number of cases of pleuritic pain, as well as the distress from bronchitis in various stages, which have been greatly benefited with a few applications of these agencies. While one hesitates to apply treatment to abdominal disturbances in the absence of definite diagnosis, one will often encounter abdominal pain whose cause canont be established, where diathermy treatment will bring relief. Of course, one would not employ this treatment in the presence of pus which is a contraindication. The probability of this being excluded, this treatment can safely be applied.

Diathermy has had happy results in the relief of pain in pelvic inflammations. The traditional treatment in these conditions is heat by vaginal douches, abdominal stupes, hot-water bags, etc. While these agencies apply heat to the surfaces of the body, diathermy will direct it to the site of the inflammation, reducing the exudates causing the pain by pressure on nerves, as has already been outlined.

I shall cite one acute and one chronic case of this character as illustrative of this form of treatment.

Case 9. Mrs. B., age 31 years. Since birth of child thirteen years ago had suffered pain at intervals to left of uterus. Present illness began about two months before reference for treatment. During this period she had had constant, severe pelvic pain, most marked on left side, accompanied by moderate fever. Treatment consisted of frequent daily vaginal hot douches and hot abdominal applications. She had been informed that surgery would be imperative on subsidence of acute symptoms. She states enlargement of left ovary has decreased. There has been abundant, irritating leukorrhea. Has taken considerable aspirin daily. Previous to first office treatment she had been in bed for a month. Pulse was 94, temperature 99°. At first she would not permit vaginal examination on account of pain and apprehension.

Treatment consisted of diathermy with vaginal electrode posterior to cervix and large block tin electrode over the abdomen. After the second daily treatment pain was less and examination disclosed acute metritis with cervix drawn to the left, acute tenderness on palpation of adnexa on both sides, abundant ropey discharge from cervix. She received ten treatments during two weeks, with subsidence of pain and tenderness of uterus as well as in adnexa, unless elicited by deep bimanual examination. Leukorrhea was greatly lessened. At this time she declared herself practically free from symptoms and was obliged to return to her home in another state.

Case 10. Mrs. C., 20 years of age, had been aborted two years previous to present treatment, resulting in pain in the left pelvic region which had been continuous and without relief from treatment. She had been advised surgery would be necessary for a cure. Examination disclosed the cervix drawn to the left. There was pain on pressure and resistance to the examining finger in region of left tube and ovary. Diathermy was applied at first with electrode over the abdomen and sacral region, later the vaginal electrode being used which most effectively concentrates the heat in the affected area. Diminution of pain followed the second treatment and was completely relieved after a half dozen more treatments. She was under observation for a period of a year and a half, with no recurrence of this condition. During the previous period of illness she had suffered from severe leukorrhea which was permanently relieved by positive galvanism.

I do not wish to imply that the methods of treatment herewith described constitute a universal panacea for all forms of inflammation. A few cases have been selected for description, terminating with satisfactory results which could be duplicated by many others. At the same time unsatisfactory and disappointing results necessarily pertain to some cases. Yet I believe no other methods of treatment are available which will produce such consistent and successful cures of painful conditions resulting from infection and trauma.

I would like to emphasize the importance of early treatment after the inauguration of the sorts of pathology above discussed. If these methods of physical therapy were utilized very soon after the establishment of an infection or infliction of trauma, relief from symptoms might be expected in a brief time. After weeks and months have elapsed, however, and organized exudates have been firmly fixed in the soft tissues, together with fibrosis of muscles, tendons and ligaments, with consequently established adhesions, long periods of treatment may be anticipated for obtaining relief, and many cases cannot be restored to normal conditions.

ELECTROCOAGULATION OF ACCESSIBLE MALIGNANT AND NON-MALIGNANT GROWTHS*

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Electrodesiccation and electrocoagulation of accessible malignant and nomalignant growths, which were first advocated in this country by Drs. W. L. Clarke and Phafler of Philadelphia, have a definite place as valuable methods in treating these conditions. They may be used alone or in conjunction with surgical removal, radium and roentgen-ray therapy. They are not to be used indiscriminately or in all cases, but only when indicated and with a definite purpose in mind.

This method of treatment offers the best prognosis when it is used primarily, but it may be of value in some cases where other therapy has failed. It is not to be recommended in case of extreme fibrosis resulting from radiation therapy. For proper use of this method it is essential that the operator know when to employ it, how much tissue it is necessary to destroy, and how to select his cases properly.

We cannot expect electrocoagulation to be a cure in all cases. Until recent years, largely because of lack of instruction in its use in medical schools and its wide-spread use by quacks and fakers, electrotherapy has been taboo by the medical profession. But within recent years it has taken its proper place and received recognition as a valuable aid in the treatment of malignancies by many physicians who have taken the time to examine results and to acquire proper technic and skill. When correctly applied it is a method above reproach, and in properly selected cases will give end-results such as can not be secured in any other way. In particular, it will be found that the amount of scar tissue formation and deformity will be surprisingly small and very satisfactory to the patient.

A high frequency current from a high standard high frequency machine must be used in this method. In electrodesiccation we use a single pole connected to the Oudin current which has a relatively high voltage and low amperage. In electrocoagulation, on the other hand, we use two poles connected to the D'Arsonval current which has a relatively low voltage and high amperage.

Neither of these methods is comparable to the use of the actual cautery, since neither of them, properly used, should produce charring. When cauterization of sufficient intensity to destroy new growths is used, considerable charring of the tissues is produced, and this in turn acts as an insulator and prevents the proper penetration of heat into adjacent areas. On the contrary, heat when produced by surgical diathermy or electrocoagulation is the result of the resistance of the tissues themselves to the passage of the electrical current and can be applied as superficially or as deeply as desired by the operator. A note of warning must be given that it is absolutely essential to have a genuine high frequency machine, as a low frequency current causes painful muscular contractions and great discomfort to the patient.

Anesthesia may or may not be required. Either local or general may be used. Small superficial growths may easily be removed without anesthesia of any sort. When large areas are involved or the growths are located in sensitive regions, a local anesthetic may be used. It should be injected into the surrounding healthy tissue rather than into the pathologic tissue. Analgesia, such as is produced by scopolamine and morphine, may be sufficient in some cases, or these drugs may be combined with nitrous oxide or with oil and ether by rectum. If the region treated is not near the face, ether may be employed, but it is best in these cases to remove the ether from the room before the current is used in order to avoid danger of explosion. Ether and oil by rectum give a very satisfactory anesthesia, the only objection being the continuance of the narcosis after the operation has been completed. This difficulty may be overcome in part by washing out the rectum at the conclusion of the operation.

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

In small superficial growths it is best to use electrodesiccation by the unipolar method, the electrode being connected to the Oudin current which has high voltage and low amperage. The best electrode to use is a small, sharply pointed one, such as a cambric needle or a small wire, held in a suitably insulated holder. The tip of the needle is held a short distance from the growth and an electric spark jumps across to the tumor; this dehydrates the tissue and destroys the cells in its path. A slightly deeper effect can be obtained by just inserting the electrode into the tissues but taking care not to produce charring such as occurs in fulguration.

When the growth is so situated or of such size as to make a local anesthetic necessary, it is best to inject the fluid into the tissue a short distance away from the mass and produce anesthesia throughout the entire area without injecting any solution into the growth proper. It is advisable to leave the desiccated tissue to separate spontaneously. The resulting scar will be less prominent and more flexible.

Electrodesiccation is applicable to small epitheliomata on the skin, warts, moles, especially the dark, pigmented type, leukoplakia, keratoses, small polypi, urethral caruncles, small tumors of the bladder, larynx and rectum, refractory corneal ulcers, pterygium, trachoma, cervical erosions, small angiomata, hemorrhoids and certain cases of diseased tonsils.

Quite different from electrodesiccation is the process of electrocoagulation or surgical diathermy. This consists in the use of the bipolar D'Arsonval high frequency current. The active electrode may be a small disc, a piece of metallic wire or a large or small sewing needle. The needle in my opinion is preferable. The indifferent electrode, on the other hand, is a large metallic pad about eight by eight inches which is connected to the second pole of the machine. Upon this electrode is placed a nonmetallic wet pad, such as a folded bath towel. The patient's shoulders or hips are placed upon the wet pad over the electrode, and even contact and maintenance of the position are insured by bandaging the electrode in place. Uniform contact will remove all possibility of burning which might occur, if the contact of the patient's skin with the wet pad were uneven or if the patient moved about because of uncomfortable heat. The metallic electrode may be of lead or copper wire mesh; the mesh is better as it makes a more even contact. Should the patient be lying on a metallic table, it is advisable to have a rubber sheet between him and the table.

Good judgment as to how much tissue is to be destroyed is essential to the best results. This can only be gained by experience. In a general way we can be guided by remembering that tissue will be destroyed beyond the zone of apparent coagulation, usually for a distance of one-half to one inch. At the beginning of the operation an area of coagulation should be produced in the area about the growth in order to block all blood and lymph channels and prevent the dissemination of tumor cells. If desired, tissue can then be removed from the still uncoagulated central region for laboratory diagnosis. The tumor mass itself is next destroyed and the bulk of the coagulated tissue removed. If, after this is done, there is bleeding or oozing, this may be controlled either by additional desiccation or further superficial coagulation.

In cavity work we must be careful not to remove tissue too deeply on account of the possibility of severe secondary hemorrhages which are most likely to occur in cavities. It may even be advisable to do preliminary or secondary ligation of the lingual artery in mouth cases or of the external carotid in jaw and neck cases.

The strength of the current depends on the size of the growth, just enough being used to produce quick coagulation. The possible evil effects of too strong a current must be borne in mind when working in proximity to the brain or heart.

The aftercare of these patients is important. For the first four or five days a dry sterile dressing is best. After this antiseptic dressings may be used and gentle attempts made to remove the dead tissue. To lessen any foul odor that may be noted, one may apply powdered sugar, or use a small amount of iodoform or Dakin's solution. Sloughing is usually complete within two or three weeks and at that time healthy granulations should be visible in the wound. At this stage, benefit will be gained if local ultraviolet radiation is given. If a lamp is available, one will find that general, tonic

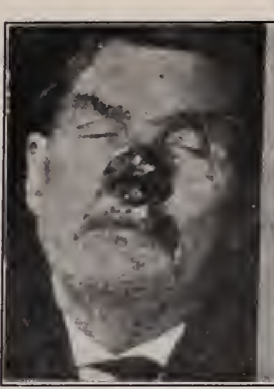

Fig. 1.

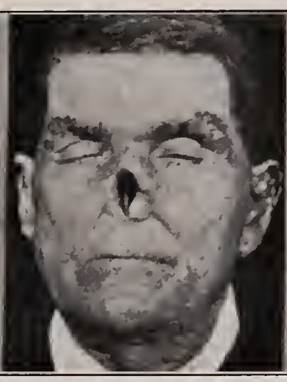

Fig. 2.

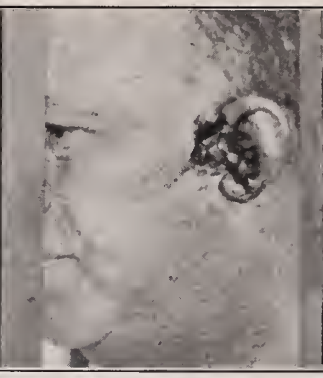

Fig. 3.

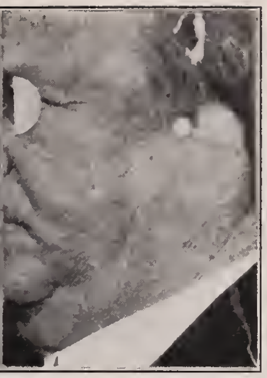

Fig. 4.

Fig. 1. Squamous cell epithelioma of the nose, upper lip and septum (Dr. W. L. Clark).

Fig. 2. Result of one desiccation operation under local anesthesia (Dr. W. L. Clark).

Fig. 3. Basal cell epithelioma involving the ear and surrounding tissues, the mastoid bone, also the ear canal almost down to the tympanum (Dr. W. L. Clark).

Fig. 4. Demonstrating refinement of control and the result of one desiccation operation under ether anesthesia. Both facial nerve and hearing were conserved (Dr. W. L. Clark).

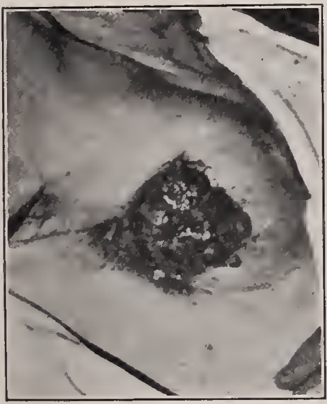

Fig. 5.

Fig. 5. Illustrating a type of carcinoma of the breast in which the coagulation method is indicated in combination with radium, x-rays, or both (Dr. W. L. Clark).

untraviolet radiation will be of value to the patient from the start. Zinc oxide ointment may also aid in healing. Complete closure will probably take place in from six to twelve weeks. If the laboratory reports show a high degree of malignancy (three or four), one should always use surgical diathermy in conjunction with x-ray and radium. One very helpful factor in these cases is the immediate relief of pain because of the destruction of the nerve ends by the coagulation.

When dealing with large cancers, plastic operations may improve the cosmetic results. Skin grafts may be made on healthy granulations.

Electrocoagulation can be used on any malignant growth, but its special fields are those where complete surgical removal is impossible, or where there are recurrences which are difficult or impossible to remove surgically. One of the most promising fields for its use is malignancy of the nasal antrum. In these cases it will do more than any other single method or combination of methods.

Within the past sixteen years I have come in contact with several cases of malignancy of the antrum, and a brief resume of these may be of value.

Case 1. In 1911, when I treated my first case, I was unable to find in the literature a single reported cure of malignancy of the antrum. The pathologic report in this case was epithelioma. I operated, doing a complete excision of the right upper maxillary bone. There was a prompt recurrence and the patient died about nine months later.

Case 2. First seen in November, 1922, a man aged 52. Diagnosis was carcinoma of right antrum. The first signs of the disease were noticed three months before the institution of therapy. After the extraction of an upper right tooth the condition became rapidly worse. When treatment was begun, the growth had broken through the roof of the mouth, and x-ray films showed that the lateral wall of the right antrum also was destroyed. High voltage therapy was given intensively. There was a temporary improvement but about nine months after treatment was started the patient began to decline and died within a few months.

Case 3. First seen in March, 1924, a man aged 40. Diagnosis was carcinoma of floor of right antrum. There was at that time a painless, carcinomatous ulcer perforating into the right side of the roof of the mouth. Two months before x-ray therapy had been instituted, an upper right molar had been extracted, leaving an opening into the floor of the diseased antrum. Radium and high voltage x-ray therapy were used. The patient improved for a time but died within a few months.

Case 4. First seen in July, 1926, a woman aged 47. Diagnosis was carcinoma of right side of nose. About two and a half years before this time the patient had had nasal polypi removed. In June, 1926, an incomplete and incompetent electrocoagulation was done intranasally. From July to October, radium and high voltage x-ray therapy were used. Improvement took place at first, but within three or four months the patient began to grow worse. She died less than a year after the first interference.

Case 5. First seen in October, 1926, a woman aged 50. Diagnosis was carcinoma of right nasal antrum. The patient had had a discharge from the nose and nasal obstruction for four or five months before the diagnosis was made. During this time nasal polypi were twice removed, and each time promptly recurred. When the patient was first seen we recommended a radical electrocoagulation with destruction of the roof of the mouth. This the patient refused to have done. Accordingly, in October, 1926, an incomplete coagulation was done through the nose. The area destroyed included the right antrum, the right anterior and posterior ethmoids, the palate and the interior of the nose. Immediately afterward radium and high voltage x-ray were begun. For about four months the patient improved steadily, but in March, 1927, there was definite recurrence of the malignancy both in the roof of the mouth and the nasal fossa. She refused further coagulation therapy and at last accounts was in the hands of an irregular practitioner.

Case 6. First seen in December, 1925, a man aged 71. Diagnosis was carcinoma of right nasal antrum. On December 20 a thorough electrocoagulation was done, destroying the antrum, the roof of the mouth, the soft palate and part of the hard palate. One month later 200 milligram hours of radium therapy were given, followed within four weeks by high voltage x-ray. Two later series of x-ray treatments were given. On April 10, 1927, almost sixteen months later, the patient was examined in Spokane. No evidence of malignant disease could be found at that time. On July 29 the patient himself reported by letter that he feels entirely well and believes himself cured.

Case 7. First seen in 1921, then an elderly woman. At this time the patient had a carcinoma of the rectum. She was treated with radium. There was a severe reaction and eventually the tumor disappeared. There was never any local recurrence. In 1925, a tumor appeared on the left arm above the elbow; it was removed and recurred. It was again removed and radium used postoperatively. There was no local recurrence. Early in 1927, small malignant nodules made their appearance in the left nostril and the left upper cuspid region. During the spring and summer of 1927 heavy radium treatments were given and seven malignancies removed from various parts of her body. This work was done in a Pacific Coast clinic. The patient died in August, 1927.

SUMMARY

Electrothermic methods are those of choice in certain types of new growths on the surface of the body and in practically all accessible cavities. The wounds remain open after the operation and thus permit better drainage. The blood vessels and lymphatics are blocked by the coagulation, thus lessening or preventing metastases as well as decreasing the absorptioin of toxins. The nerve destruction produces relief or complete absence of pain. In more advanced cases coagulation may be used to control hemorrhage and in preparation for possible radiation therapy. If there are suspicious recurrent granulations later, they can be given further electrodesiccation, electrocoagulation or radiation with radium or x-ray.

THE TREATMENT OF NEW GROWTHS OF THE SKIN *

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The recent cancer publicity of the American Society for the Prevention of Cancer is causing many people to seek the aid of their physicians on account of growths on the skin. Some of these growths prove to be malignant and demand prompt, thorough removal. Others, the so-called premalignant lesions, are equally important, for their early removal would practically stamp out cutaneous cancer. Still others are absolutely benign and require either no treatment at all or removal for cosmetic reasons.

All physicians agree upon the necessity for the prompt, thorough removal of these premalignant and malignant dermatoses. Here, however, their agreement ends, for there are widely divergent views as to how these growths should be removed. Many surgeons prefer the scalpel and curette. Radiologists swear by radium and x-ray therapy, rightly claiming cosmetic results superior to all other methods. Percy and his followers aver that the actual cautery excels all other treatments and that radiation is of little value. Still others believe that the electrothermic modalities, including electrodesiccation, electrocoagulation and the radio knife offer the best chance of cure.

The truth is that all of these methods are of value in different types of cases. It is better for one to select the type of treatment best suited to the lesion at hand rather than to allow his enthusiasm over one particular type of treatment to cause him to treat all lesions by his pet method. No claim is made that the following ideas represent the last word in treatment, but rather, merely that they are the ones which have seemed best to suit the cases in my own practice, where all of the various methods are available.

WARTS

Warts have been removed with everything from radium to cucumber juice gathered in the dark of the moon, and still no one hundred per cent perfect method has been devised, for these insignificant, benign growths have an inherent tendency to recurrence which is equaled only by cancer. At the Univesity of California Infirmary, where a dozen to

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* Read before a meeting of the Staff of Merritt Hospital, Oakland, Calif., Jan., 1928.

fifteen cases are often treated daily, we have tried nearly all of the modern methods and have come to believe that removal with electrodesiccation gives the lowest percentage of recurrences. This, however, is somewhat painful and leaves an open wound.

In my private practice I generally use x-ray or radium. Plantar warts, especially, are best treated with heavy doses of the beta rays of radium. After having pared off the horny epidermis, a ten milligram half strength placque, filtered through rubber dam, is applied for two hours. No open wound is left on the foot to invite infection or impair the patient's locomotion.

ANGIOMAS

Angiomas require removal for cosmetic reasons. The best time to do this is in early infancy, after waiting long enough to see that the growth is not going to involute spontaneously as some of them do. Tiny slightly elevated angiomas can be removed very quickly with carbon dioxide snow. If they are larger than a split pea, radium is preferable. I prefer the beta rays in lesions less than one cm. in depth and use the gamma rays in the deep cavernous type. The flat port wine stain birth mark can be removed with carbon dioxide snow or heavy doses of radium, but the result is not as good as in the angiomas and many cases are better off when left alone.

MOLES

Small light brown moles can be removed with safety and with excellent cosmetic results by fifteen to thirty second applications of carbon dioxide snow. If they are somewhat darker and slightly elevated I believe electrodesiccation is preferable. The shiny, purplish black mole should be left absolutely alone, unless it is subject to irritation or shows signs of growth. Under these circumstances it should be removed by radical electrocoagulation, blocking the blood and lymph channels around the growth itself. Never use anything less than the most radical of measures on this particular type of mole.

KERATOSES

The small, superficial, senile or seborrheic keratoses respond beautifully to instantaneous touching with the actual cautery. Practically no scar is left. If these form coin sized patches, it is my practice to apply a ten milligram one-half strength radium placque for fifteen to thirty minutes, filtered through rubber dam only. Larger doses are applied, if the keratoses show any malignant characteristics. Keratoses which develop on the dorsum of the hands are more dangerous than those on the face and should be treated more radically. I prefer to electrodesiccate them, or, if they are at all suspicious, to be still more radical and electrocoagulate them.

Leukoplakia can be removed by the cautery, desiccation or radium, but quite commonly recurs. My preference is for destructive doses of the beta rays, for instance a ten milligram one half strength radium placque applied for forty-five minutes through rubber dam. If the lesion is in such a position as to make radium application difficult, electrodesiccation is used.

I have cured one case of extramamary Paget's disease by excision with the "radio knife." A wide margin of normal skin was included; the edges were undermined and the wound sutured. Healing took place by first intention. The growth was on the buttock and measured five cm. in diameter. A fibromyxoma of the chest wall was successfully removed with the same modality.

BASAL-CELL EPITHELIOMA

The small, superficial psoriasiform nonulcerated basal-cell epithelioma is readily cured by forty-five to sixty minute applications of a ten milligram, half strength radium placque, using a filter of rubber dam. If ulceration or nodules are present, the harder beta rays seem to work better. In these cases I use the same placque but use three hour applications filtered through one tenth mm. of brass and rubber dam. When the lesions are larger, say over two cm. in diameter, I feel safer in using electrodesiccation or electrocoagulation. Desiccation is used on the superficial lesions and coagulation on the deeper ones. In either case the destroyed material is curetted out and the base desiccated again. From one-fourth to one inch of normal tissue is destroyed around the growth. When the wound has just about healed, I apply two and one-half skin units of unfiltered x-ray. Electrocoagulation is nearly always used when the area involved measures over a centimeter in depth.

In the very extensive epitheliomas involving the whole side of the face, the lower jaw or the orbit, where extensive dissection and destruction of deeper structures is necessary, the Percy cautery seems to be superior to other methods. I believe that cases as extensive as these are a major surgical problem rather than a dermatologic one.

The squamous-cell epithelioma of the lip and tongue in my opinion are best treated by electrocoagulation, including a wide area of normal skin. Excision with the actual cautery is also a very valuable procedure.

SUBCUTANEOUS BLOOD TRANSFUSION IN CHILDREN*

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AND
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The first recorded attempt at blood transfusion occurred in 1492 on Pope Innocent VIII. During the process the recipient and three donors died. The operation had been vaguely known before that, and obscure allusions by the Roman poets indicate that it may have been practiced as early as the Augustan age. Silver cannulae for direct transfusion were first made in France by a Benedictine monk, Robert de Gabets, in 1651. Shortly thereafter Denis, of Paris[2], and Lower, of London[3], did some careful experimental research, but the work was stopped through the opposition of the academy of medicine of Paris. A century ago Blundell[4] transfused an obstetric case. In 1908 Alexis Carrel gave the first transfusion for hemorrhagic disease of the newborn, since which time the use of blood in this condition has proven to be a specific. Transfusion has now demonstrated its value in many conditions. Unger[5] states that the indications for the use of blood are (1) hemorrhage, (2) diseases of the blood, (3) toxemias, (4) nutritional disturbances, (5) shock and (6) infections. Allan Brown[6] has shown that in extremely toxic states, exsanguination-transfusion is of life-saving importance.

Although the value of transfusion in pediatric practice has been demonstrated, the difficulties and dangers of the intravenous injection of blood have prohibited its extensive use by the majority of physicians. The blood must be typed and matched and the matching must be repeated before each transfusion, as shown by Sidbury[7]. This requires hospital and laboratory equipment and involves the loss of valuable time. When the blood has been collected and the difficult procedure of introducing it into the child's veins has been accomplished, one has yet to face the dangers of possible hemolysis, agglutination or reactions referable to neither of these.

In an effort to find a safer, simpler and speedier method of administering human blood two have been developed: (1) the intraperitoneal and (2) the subcutaneous. The literature on the former method has been carefully reviewed by Siperstein and Sansby[8] and need not be repeated here. Their work demonstrated that whole blood given intraperitoneally produced clots in every instance but that good results were obtained when the blood is citrated with a freshly prepared solution.

Blood injected intraperitoneally requires typing and matching the same as for intravenous use because a certain portion of it passes unchanged into the circulation of the recipient. Also cases are reported of punctured intestine or failure in the absorption of the blood, with resulting adhesions.

The subcutaneous and intramuscular routes have long been used for giving small amounts of blood and serums. Although large amounts of normal saline and glucose solutions have been given under the skin, little attempt has been made to use blood in like quantities. Zingher recommended the use of four to eight ounces of citrated blood intramuscularly and Holm[9] a similar amount subcutaneously, but the literature at our disposal contains no reference to amounts larger than this.

Our experience with subcutaneous blood transfusion dates back to 1920. While giving 10 per cent glucose in normal saline by hypodermoclysis in quantities up to 500 c.c. daily, the idea presented itself that blood could be used in the same way with superior results. Blood contains the most perfect combination of minerals, nutritive substances, antibodies and stimulants available. Its absorption time is somewhat slower than that of saline, although in dehydration cases the liquid portion of the blood is lapped up like water.

Subcutaneous transfusion has the advantages of the intravenous route minus its dangers. Holm[9] has shown that the temperature rises four to five degrees higher after an intravenous transfusion than after a subcutaneous one, in which blood from the same donor is used. As typing and matching are unnecessary, blood may be obtained from any healthy donor. The danger of extraneous constitutional infection is avoided by using a member of the family. Distention of the skin with blood is no more painful than with synthetic solutions. We are told* that in certain hospitals in India, where scores of transfusions are given daily, the subcutaneous route has almost entirely replaced other methods.

The technic of subcutaneous transfusions requires no elaborate equipment. The commonest error is the use of too small a needle and syringe. A fourteen to eighteen gauge needle enables one to obtain an adequate amount of blood quickly while a one hundred c.c. ground-glass syringe permits better asepsis and a more rapid injection of the blood. If whole uncitrated blood be used, the syringe may be attached directly to the needle. As no air comes in contact with the blood, clotting does not hinder the injection. A second syringe can be filled while the first is being injected. The quantity of blood varies with the age, weight and general condition of the recipient. The optimum amount with newly born and dehyrated infants is 50 c.c. per kilogram of body weight or 5 per cent. The necessary percentage decreases with age. At two years 25 c.c. per kilogram is adequate.

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* Read before the Thirty-eighth Annual Meeting of Washington State Medical Association, Tacoma, Wash., Aug. 30, 1927, and the Meeting of Oregon State Medical Society, Salem, Ore., Sept. 2, 1927.

* Personal communication.

The preferable sites for injection are the sides and front of the chest and abdomen. Care should be exercised not to allow the needle to penetrate the fascia, as the shock following intramuscular injection is greater than after subcutaneous ones.

DISEASES OF THE NEWBORN

Diagnosis	Cases	Trans.	Cured	Died	Recovery Per Cent
Melena Neonatorum	5	6	5	0	100
Atelectasis	3	5	2	1	66
Intracranial hemorrhage	2	2	1	1	50
Inanition fever	5	5	4	1	80
Prematurity	10	11	7	3	70
Congenital obstruction of bile ducts	1	1	0	1	0

Fig. 1. Series of cases of disease in newborn infants treated by subcutaneous transfusion of whole human blood.

The total amount given is usually divided and injected into two places. After the transfusion the site of the needle puncture is closed by placing over it half of a cork which is held in place with adhesive.

Citration of blood, using 10 c.c. of a 2 per cent sodium citrate solution to each 90 c.c. of blood, permits ample time for injection and makes an assistant unnecessary. Davis[10] reports that citrated blood produces greater leukocytosis. Unger[5] claims that intravenous citrated blood is less efficacious in cases of infection because the citrate causes the destruction of complement and the formation of anticomplement, a 75 per cent decrease in phagocytosis and a decrease in opsonins. Our experience with seventy-six cases demonstrates no appreciable difference in the effectiveness of citrated over uncitrated blood given subcutaneously.

Since a baby has only an ounce of blood per pound of body weight, the conservation of every drop is essential. The loss through the cord at birth may be the determining factor in a life-and-death struggle. The custom of stripping the blood from the cord before tying it is decidedly commendable. In various conditions of the new-born additional blood may save a life apparently doomed. The series of twenty-six cases presented in fig. 1 represents the most desperate ones occurring among the newly born in our practice in the last seven years. It is noteworthy that the mortality rate is only 27 per cent. We believe that transfusion was the life-saving factor in the other 73 per cent.

Blood is a specific in melena neonatorum. Although the cause of this disease is as yet unknown, empirical custom has prescribed intramuscular injections of 10 to 20 c.c. of blood. Such a quantity is so often inadequate as to necessitate repetitions, thereby increasing the pain and imperiling life by loss of precious time. If the subcutaneous route is chosen, sufficient blood may be given at one time with no difficulty to the operator and little shock to the child.

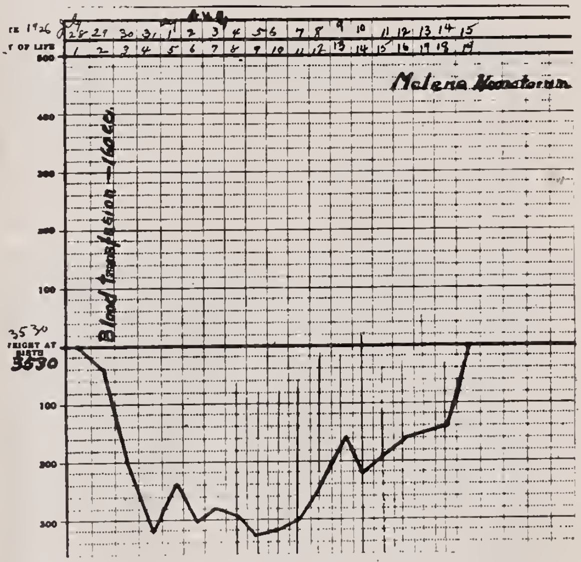

Fig. 2. 160 c.c. of blood, all but 25 c.c. of which was given subcutaneously, stopped the hemorrhage in a moribund newborn baby and provided nutrition during a critical period.

Baby D., weighing 3530 grams (7 lbs. 13 oz.) at birth, vomited fresh blood when twenty-three hours old and a little later passed a double handful of blood-red stool. Five c.c. thromboplastin was given immediately. At twenty-six hours the condition was extremely grave. Twenty-five c.c. of citrated blood was given intravenously and 135 c.c. subcutaneously. Improvement was slow for ten days and then rapid. When leaving Multnomah County Hospital on the nineteenth day the baby was in good condition and had regained its lost weight (fig. 2). In this case the mother's diet may have been a causative factor in the baby's hemorrhage.[11, 12]

Another melena case is that of Baby B., who weighed 3375 grams (7½ lbs.) at birth. He was the sixteenth child of apparently healthy parents. Poverty had definitely limited the mother's diet. Blood appeared in the baby's stool when forty-two hours old. One c.c. of fibrogen was given at once. Shortly thereafter 65 c.c. citrated maternal blood and the following day 80 c.c. citrated paternal blood were administered subcutaneously, making approximately 50 c.c. per kilogram. Dark blood was passed for another thirty-six hours, followed by a gradual recovery.

Transfusion is also valuable in intracranial hemorrhage. It is just as important to stop the hemorrhage as it is to remove the extravasated blood by lumbar puncture.

Baby A (fig. 3) weighed 2800 grams (6 lbs.) at birth. When twelve hours old, nystagmus, muscular twitching with left-sided facial paralysis developed. Lumbar puncture revealed a bloody spinal fluid. One hundred and seventy c.c. of citrated blood were given subcutaneously. Subsequent lumbar punctures showed a decreasing amount of blood in the spinal fluid which became clear in a few days. The signs of cerebral irritation gradually decreased and the weight of the child improved.

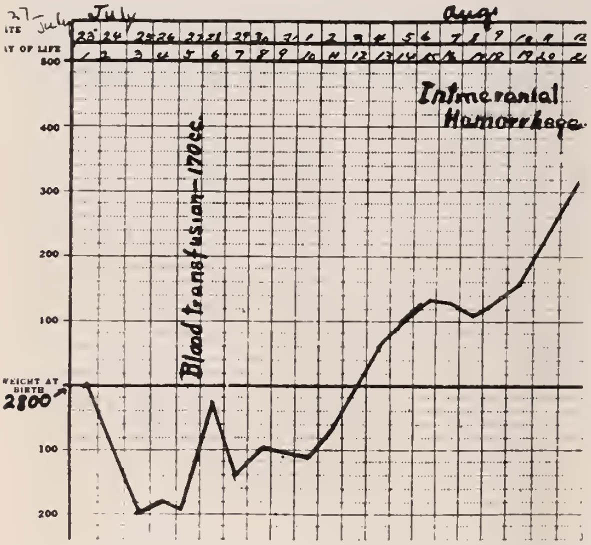

Fig. 3. Cerebral hemorrhage checked and improvement rapid after injecting 170 c.c. citrated blood under the skin of the abdomen.

In both types of cases the infant is often in a poor nutritional state. The food value of larger amounts of blood which can be gradually absorbed and easily assimilated is of distinct advantage. The iron content of the injected blood and its stimulating effect upon the hemapoietic organs improves the associated secondary anemia.

Premature babies are often too weak to obtain and assimilate sufficient food for their metabolic requirements. Increasing the blood content 50 per cent or more is a life-saving procedure.

An illustrative case is that of Baby H., whose birth-weight was 2150 grams (4 lbs. 12 oz.). When seen by us at two weeks of age he weighed 1590 grams (3 lbs. 8 oz.), was emaciated, dehydrated, cyanosed, hypertonic and too weak even to swallow. Three ounces of citrated paternal blood were injected under the skin of the abdomen. A visiting physician remarked that it was a waste of time to attempt to save a baby so nearly dead. After a few hours the infant began to revive and the next day was able to swallow. When he left the hospital ten days later he weighed five pounds, was nursing vigorously at his mother's breasts and showed little evidence of his recent narrow escape.

A similar case is that of Baby S., referred by Dr. C. D. Bodine, an eight months babys, whose birth-weight was 4 lbs. 1 oz. The accompanying illustration (fig. 4) indicates his gain in weight following the injection of 105 c.c. of whole citrated blood.

Premature and immature babies may require more than one transfusion. If the baby is in a serious condition, a portion of the blood may be given intravenously. The amount so given should never be over 50 per cent of the total quantity of blood possessed by the infant himself.

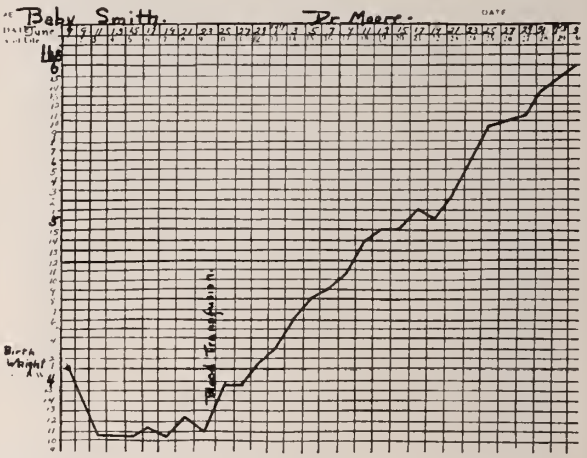

Fig. 4. Rapid gain in weight in a premature baby after the injection of 105 c.c. of whole citrated blood.

Baby W. was brought in by Dr. E. R. Huckleberry a distance of one hundred and twenty miles when one day old. It weighed approximately four pounds and the complaints were cyanosis, irregular breathing and inability to retain either food or water. Examination revealed extreme blueness of the extremities and lips, a deeply sunken fontanelle, eyes fixed and glazed and a dry and hypotonic condition of the skin. The lungs showed dullness over the right lower lobe and left intrascapular region. Atelectasis and anhydremia were evident. Oxygen was given and the baby transfused subcutaneously with 150 c.c. of the father's blood. Oxygen had to be repeatedly given for the "sinking spells." It was, therefore, deemed advisable to give additional blood. The blood of the father and the baby were of homologous types and matched perfectly. Sixty c.c. of uncitrated paternal blood were slowly injected into the median basilic vein of this tiny baby. The load on the heart was distinctly heavy for a time. Another 40 c.c. of blood were injected subcutaneously. The baby cried lustily for the first time and after that gradually improved.

However, an accompanying pyloric obstruction was so severe as to require one-thirtieth grain of atropin sulphate daily to control it. With the absorption of the blood the projectile vomiting was improved and at ten days of age the baby was dismissed to the family physician. In the first transfusion 80 c.c. of blood were injected without citration under the skin of the abdomen on one side and 70 c.c. of blood, plus 10 c.c. of citrate solution on the other side. This and similar tests on other cases have shown that the rate of absorption of citrated blood is approximately three times as rapid as with uncitrated.

Baby L., referred by Dr. C. D. Bodine, is another case of atelectasis in a premature. The mother had been unable to carry three previous pregnancies to viability. With this one she was so toxic and edematous that a cesarean section was done at seven and one-half months. The baby weighed 1640 grams (3 lbs. 10 oz.). Two subcutaneous blood transfusions were done on the fourth and the nineteenth days respectively. The weight increased, as shown in fig. 5. During the week previous to the second transfusion the baby received the same amount of food as during the week following it. The increase in weight can be explained only by an increase in food tolerance and assimilability.

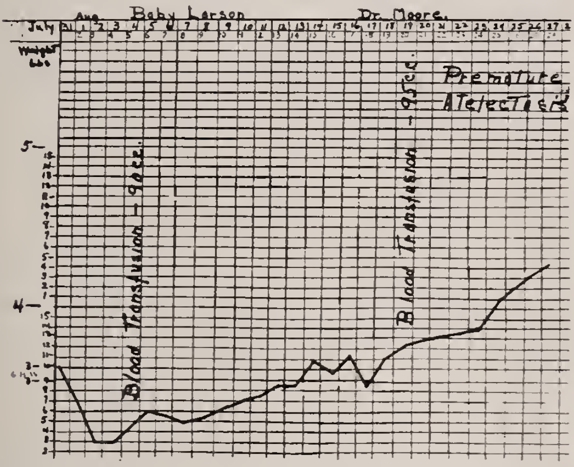

Fig. 5. Successive subcutaneous transfusions increased the ability of Baby L., a premature infant, to assimilate food.

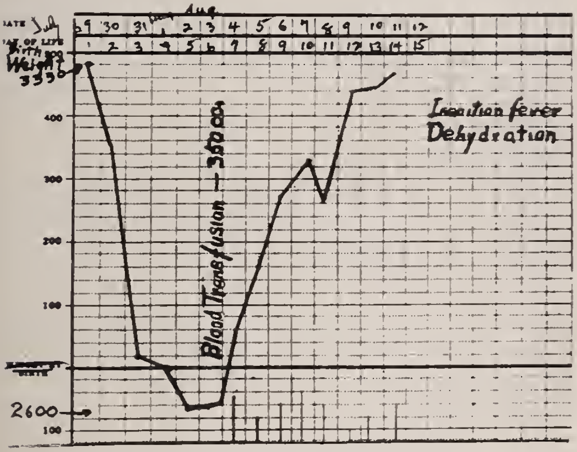

Fig. 6. Baby B. illustrates the rapid increase in weight following a subcutaneous transfusion of 350 c.c. of blood.

When starvation in the newborn has been sufficient to produce inanition fever with its associated acidosis and dehydration, blood is the remedy *par excellence.*

Baby B., weighing 3330 grams (7¼ lbs.), lost 730 grams (24 oz.) in four days (fig. 6). Subcutaneous transfusion with 350 c.c. of citrated blood caused as rapid an improvement in the clinical condition as occurred in the weight.

The effect of blood upon the nutrition of older infants who have failed to thrive is often dramatic (fig. 7). It will be seen that there were but four deaths in this series of thirty-four cases, yet nearly half of these children were moribund when first seen.

NUTRITIONAL DISEASES

Diagnosis	Cases	Transfusion	Cured	Imp.	Died	Recov-ery ery Per Cent
Diabetes	1	1	...	1	0	100
Pyloric obstruction	2	3	2	...	0	100
Scurvy	2	2	2	...	0	100
Spasmophilia	3	4	3	...	0	100
Athrepsia	18	20	14	...	4	77
Malnutrition	8	8	8	...	0	100

Fig. 7. Excellent results obtained by subcutaneous transfusions in a series of cases of nutritional diseases. Most of these patients were desperately ill.

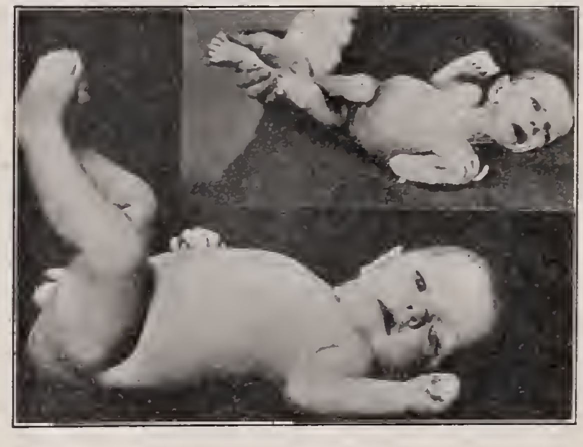

Fig. 8. Case of pyloric stenosis treated with subcutaneous blood transfusion. Upper picture shows condition at ten weeks of age (weight 2¼ pounds less than at birth); lower picture, appearance at six months.

Baby U. weighed 2380 grams (5 lbs. 4 oz.) at ten weeks of age. His weight was 3400 grams (7½ lbs.) at birth. At one month of age he began to vomit nearly all the food taken. The family physician removed him from the breast and gave a series of infant foods. The result was a marked dehydration and an emaciation so extreme that even the sucking pads were gone. The surgeon called in to operate for the pyloric stenosis refused to consider operation because of the moribund condition of the baby. Two hundred c.c. of citrated blood were injected under the skin of the abdomen immediately and as his strength improved the usual dietary treatment for pyloric obstruction was begun. One week later another transfusion of a like amount was given, following which the gain in weight and strength were very rapid. Breast milk was reestablished and in a few weeks he was entirely breast fed. His appearance at ten weeks and at six months is shown in fig. 8.

The presence of immune bodies in blood makes it a valuable therapeutic agent in infections. We have used this method of treatment in the most serious of the various infections that come under our care (fig. 9). Those cases infected with pyogenic organisms were most benefited.

INFECTIOUS DISEASES

Diagnosis	Cases	Transfusion	Cured	Imp.	Died	Recovery Per Cent
Diphtheria	2	2	1	....	1	50
Measles	1	1	1		0	100
Pertussis	1	1	1		0	100
Scarlet Fever	1	1	0		1	0
Erysipelas	2	2	1		1	50
Encephalitis	2	2	1		1	50
Meningitis	1	1	1		0	100
Tb. Meningitis	3	3	0		3	0
Pneumonia	5	5	3		2	60
Empyema	2	4	2		0	100
Pyemia	1	1	1		0	100
Septicemia	4	6	0		4	0
Enteritis	1	1	1		0	100
Pyelitis	1	1	0	1	0	100
Chr. Infectious Arthritis	1	1	0	1	0	100
Purpura Rheumatica	1	1	0	1	0	100

Fig. 9. Many types of acute infection are benefited by the injection of whole blood.

Virgil S., aged thirteen, had had multiple osteomyelitis with drainage from various sinuses for five years. When seen by us he was extremely emaciated, weighing only forty-nine pounds and had a generalized pyemia. Both knees were painful, swollen and red. Four sinuses were draining, most of which had been open for two years or more. His hemoglobin was 55 per cent. A pint of citrated blood was given subcutaneously. On leaving the hospital four weeks later he weighed sixty-one pounds, a gain of twelve pounds. Ten days later the weight was sixty-five pounds and the hemoglobin 70 per cent. After one year without additional treatment, all but one of the sinuses had healed, the weight was seventy-five pounds and the hemoglobin 77 per cent.

The anemias secondary to infections respond readily to this type of treatment.

Baby C., aged fourteen months, after a series of infectious diseases during his first year developed a severe secondary anemia. His blood findings and the rapid improvement under treatment are shown in fig. 10.

Purpuras associated with acute infections are definitely improved by blood injections.

Donald T., aged one year, weighed 8100 grams (18 lbs.). When first seen he was sleeping constantly day and night and had a pharyngitis and otitis with temperature 102°, accompanied by purpuric spots on feet and legs. Even after the ear was draining well new petechial hemorrhages appeared.

The blood findings obtained twelve days apart were as follows:

Date	Hgb. Per Cent	R.B.C.	W.B.C.	P.M.N. Per Cent	S.L. Per Cent	L.L. Per Cent
5-13	60	4,040,000	16,400	55	42	3
5-25	75	5,020,000	15,600	57	42	1

On May 14 180 c.c. of the father's citrated blood were injected subcutaneously. The purpura soon disappeared and the child made a gradual but complete recovery. Ten days later the hemoglobin had increased another 10 per cent and the red blood cells in proportion.

ANEMIA

Date	Hemoglobin Per Cent	Erythrocytes	Treatment
9-18	40 (Dare)	5,560,000 (Poikilocytosis	
9-28	37 (Newcomer)	5,658,000	60 c.c. citrated blood
10- 2			240 c.c. citrated blood
10- 6	51 (Newcomer)	5,060,000	
10-12	60 (Dare)	5,120,000	
10-15	72 (Dare)	5,890,000 (Cells Normal)	
10-17	73 (Dare)	5,676,000	

Fig. 10. Baby C. Blood findings in a case of secondary anemia before and after subcutaneous blood transfusions.

Blood may be used to advantage in those operative cases associated with inability to take or retain food (fig. 11). If the case is a septic one, the antibody content of the blood injected is an added advantage.

George B., aged five and one-half years, seen first at midnight, was suffering from a ruptured appendix and was in a highly toxic condition. Immediate operation by Dr. H. E. Bundy revealed also a general peritonitis. Appendectomy with drainage was done and 150 c.c. citrated paternal blood given subcutaneously. As he could retain neither food nor water, two hundred c.c. 10 per cent glucose in normal saline were given twice daily. On the seventh postoperative day another subcutaneous transfusion of 175 c.c. of blood was done. Thereafter his progress was uneventful.

OPERATIVE CONDITIONS

Diagnosis	Cases	Transfusion	Cured	Died	Recovery Per Cent
Mastoiditis	1	1	1	0	100
Infected tonsils	2	2	2	0	100
Ruptured appendix	1	2	1	0	100
Ulcerated Meckel's diverticulum	1	1	1	0	100
Harelip and cleft palate	1	1	0	1	0

Fig. 11. The antibody content and nutritional value of blood make it a valuable therapeutic agent in operative conditions.

Postoperative starvation in children frequently produces a severe, even dangerous acidosis.

An example of this in a seven year old girl is observed in Jane Z. A previously perfectly healthy child was found in extremis forty-eight hours after a properly performed tonsillectomy. The respiration was markedly hyperpneic, the eyes were sunken and glassy; in fact, the patient was moribund. Glucose ampoules were obtained from a nearby drug store and 200 c.c. of 25 per cent solution were injected subcutaneously. She was then rushed to a hospital and 460 c.c. citrated paternal blood were injected under the skin of the abdomen. The blood absorbed more rapidly than the glucose in so high a percentage. Paralytic ileus, inability to urinate and bronchopneumonia developed in rapid succession, but yielded to treatment. After nine days she was returned to her home and made a complete recovery.

COMMENT

In a series of seventy-six cases, many of which were in extremis, subcutaneous blood transfusions were used with 68.5 per cent of recoveries. If three cases of tuberculous meningitis and one of congenital obstruction of the bile ducts are omitted, in all of which transfusions were done before the diagnoses were made, the percentage of recovery is 73.3. In thirty-three cases, or 43.4 per cent, we feel that the transfusion was the decisive factor in the favorable outcome. According to Abt[13] intravenous transfusion is followed by recovery in 55 per cent of cases and is a life-saving procedure in 35 per cent. The results obtained by subcutaneous transfusion of blood compare favorably with those obtained by intravenous transfusion. The former method is so safe that the health-giving properties of blood need no longer be reserved for those in extremis. It is so simple as to be available to every physician, whether hospital facilities are available or not.

SUMMARY

1. Transfused blood from a suitable donor is an invaluable therapeutic agent.

2. Subcutaneous transfusion avoids the dangers of the intravenous or peritoneal routes.

3. Typing or matching of bloods is unnecessary in giving blood subcutaneously.

4. Blood may be introduced under the skin quickly and with no difficulty.

5. The amount of blood given subcutaneously varies with the age, weight and condition of the patient. In general, the optimum amount for newborns is 50 c.c. per kilogram, or 5 per cent of the body weight, and for children over two years of age 25 c.c. per kilogram.

6. There is very little reaction following a subcutaneous blood transfusion.

7. Citrated blood absorbs more rapidly than uncitrated.

8. Our statistics in seventy-six cases show that this method was curative in 68.5 per cent and of life-saving value in 43.4 per cent.

9. Subcutaneous transfusion is so effective and yet safe and simple that it deserves more general use.

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RELATIONSHIP OF THE PANCREAS TO GALLBLADDER INFECTION*

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The causes of recurrences following operation upon the gallbladder may be classified as follows:

1. Incomplete operation.
2. Errors in diagnosis.
3. True recurrences.
4. Coincidental lesions.
5. Complications.

Incomplete operation includes drainage of the gallbladder, when it should have been removed or the leaving of a stone in the gallbladder or common duct. Error in diagnosis cannot be avoided sometimes. That recurrences may occur is definitely known and needs no discussion. Coincidental lesion occurring with gallbladder disease is not rare. Even though operation may result in complete relief so far as the biliary apparatus is concerned, if coincidental lesions are also producing symptoms the patient will continue to have the symptoms caused by these lesions.

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The three chief complications of gallbladder disease that result in continuation of symptoms after operation are (1) hepatitis, (2) adhesions between the gallbladder and surrounding viscera and (3) pancreatitis. Adhesions are freed at the time of operation and then recurrences occur, due to neglected raw surfaces or the result of irritation even though the raw surfaces are closed. This paper will deal only with pancreatic complications.

Following Opie's paper in 1901, there has been much study to determine the relationship existing between biliary and pancreatic lesions. Infection may reach the pancreas through (1) regurgitation of bile, (2) regurgitation of duodenal contents, (3) lymphatic extension, (4) blood stream infection, (5) direct extension.

Since Opie's original paper there has been much work done both to prove and disprove his theory of extension through the duct. The pancreas arises by two different anlage, each of which has a duct. One anlage usually originates either from, with or in close proximity to the anlage from which the liver develops. As a result the duct from this anlage, the principal duct of the pancreas, the duct of Wirsung, empties into the common duct, if the anlage has sprung from the anlage of the liver; empties with the common duct through a common opening, the papilla of Vater, if the anlage has sprung from the duodenum with the anlage of the liver; or empties in close proximity to the common duct if the anlage sprang from the duodenum itself.

The other anlage springs from the duodenum at some distance from the first and the source from which it springs is marked by the duct of Santorini. In many animals the two portions of the pancreas do not unite into a definite single body, but remain as two divisions. In the human, however, it does unite and the duct of Santorini usually persists as a small duct. In eleven per cent, according to Opie, the duct of Santorini is as large as the duct of Wirsung; in twenty per cent the duodenal end of the duct of Santorini was closed and in a considerable number in which it was open, it was so small that it had but little function. Ten per cent had no union between the two ducts and in four per cent there was only a very small union.

Most authors have found that the duct of Wirsung and the common bile duct unite, so that there is a common channel of variable length in a considerable percentage. The notable exception of this finding is by Mann and Giordano[2]. In their work they found that the two ducts opened together in only 20 per cent and that in only 3.5 per cent would it be possible for an obstruction to cause regurgitation of bile into the pancreatic duct.

Lanceraux[3] in 1899 suggested the possibility of gallstones lodged in the ampulla of Vater as the cause of pancreatitis. Opie in 1901 supported this observation and reported a case, in which an acute pancreatitis had resulted from obstruction by a stone in the ampulla. Since that time there has been much discussion as to the importance of the regurgitation of bile in producing pancreatitis. Archibald[4,5] and others are firmly convinced that regurgitation of bile is an important factor, and a spasm of the sphincter as well as an obstruction from a stone in the ampulla may be the cause of regurgitation of bile.

Much experimental work has been done to show the effect of regurgitated bile upon the pancreas. Bernard[6] in 1856 first produced acute hemorrhagic pancreatitis experimentally by the injection of bile. Bernard used a mixture of bile and olive oil. Archibald obtained similar results. Flexner[7] in 1906 showed that it was the bile, particularly the taurocholate, that produced necrosis. Hess[5] produced pancreatic necrosis by injecting sterile olive oil in the duct of Wirsung. Other authors have produced a necrosis with other substances. Recently Mann and Giordano[2] in studying the effect of bile upon the pancreas found that no necrosis resulted, when the injection was made at a pressure equal to or not much greater than the secretory pressure of the liver, which is approximately 350 mm. When a pressure of 1000 mm. was used, however, necrosis was obtained. Nordmann[9] found that, when he closed the ampulla of Vater with a purse string suture, while bile was regurgitated into the pancreas no pathologic disturbance resulted, but when bacteria were injected into the gallbladder acute pancreatitis usually resulted in forty-eight to sixty-five hours.

Archibald[4] and Judd[10] have brought forth postoperative evidence that would seem to indicate that regurgitation of bile was a source in at least a certain percentage. Archibald found that drainage of the common duct over a long period of time resulted in a cure, while drainage over a short period of time was often followed by recurrences. This he attributes to the lowering of the bile pressure in the common duct long enough for recovery of the pancreas from the lesion present as the result of biliary disturbance. In studying the results in the Mayo Clinic Judd found that much better results were obtained, when the gallbladder was removed than when it was drained. This is probably due to the lowering of bile pressure in the common duct through the removal of the gallbladder, whose function is that of maintaining a pressure level.

A study of the literature upon the subject of bile regurgitation as an etiologic factor allows us no conclusion because diametrically opposite results have been found as a result of experimentation by careful observers. All are agreed, however, that bile regurgitation is possible in a percentage varying from 3.5 per cent, according to Mann and Giordano, to as high as 78 per cent by others. Definite information can only be obtained by postmortem study upon patients dying from acute pancreatitis in the presence of cholecystitis. The rarity of acute pancreatitis might be due to the limited number of individuals in whom regurgitation of bile is possible. Chronic pancreatitis occurs more frequently, but it is possible that it also occurs only in those individuals in whom there is an opportunity for regurgitation.

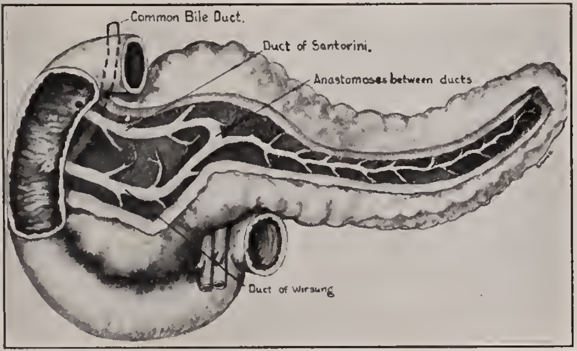

Fig. 1. Obstruction of ampulla with establishment of an anastomosis between the ducts of Wirsung and Santorini.

The pancreas may adjust itself to the continuous regurgitation of bile, when it finds another source of escape into the duodenum as was shown by a postmortem examination that I made several years ago (fig. 1). There was a stenosis at the outlet of the ampulla of Vater so that pressure upon the gallbladder resulted in the bile escaping only drop by drop. There was, however, a rapid discharge of bile from the duct of Santorini. Dissection of the pancreas revealed a dilatation of the duct of Wirsung for about one-third of the length of the pancreas, a large anastomotic connection to the duct of Santorini at this point and a dilatation of the duct of Santorini below this point, so that bile went from the common duct up through the duct of Wirsung, through the anastomosis into the duct of Santorini and then into the duodenum. The pancreas was only slightly enlarged and showed no evidence of recent inflammation. There was, however, an increase in the amount of connective tissue which was probably the evidence of inflammation at the time of the original obstruction.

Regurgitation of duodenal contents has been given as the cause of pancreatitis. That duodenal contents injected into the pancreas will produce pancreatitis has been proven experimentally. Trypsinogen is probably converted into trypsin by enterokinase. This belief that, if enterokinase enters the pancreas the conversion would occur there and digestion of the pancreas result, might be taken as supporting the duodenal regurgitation theory.

Klippel[11, 12] in 1899 suggested the possibility of infection of the pancreas through the lymphatic route from an infected gallbladder or duct. Mangeret[13] in 1908 and later Arnsberger[14] supported this theory. In this country Deaver[16] and his associates have been the strongest supporters. Sweet[16] has stated that the usual location of chronic pancreatitis is in that portion of the pancreas originating from the anlage, springing either from within or in the immediate vicinity from which the anlage of the liver springs. Judd[15] has recently concluded, as the result of the work of Mann and Giordano, that the lymphatics probably do serve as a frequent source of the infection, traveling from the biliary apparatus to the pancreas.

That the blood stream may be a source through which infection reaches the pancreas cannot be disputed, for pancreatic involvement has been found along with generalized infection. It has also been reported as a complication of appendicitis. There are no reports, however, supporting the blood stream theory as is the usual source of infection.

Trauma as an etiologic factor is also generally accepted. However, it is not a frequent factor. Direct extension, especially from the stomach and duodenum, also results in acute pancreatitis, but this likewise is not a frequent factor. It was the source of infection in one of my cases. My experience with acute pancreatitis consists of six cases, one primary and five secondary. The patient with primary pancreatitis came in in shock and died a few hours later. The postmortem examination revealed no etiologic factor. Of the secondary cases of acute pancreatitis three were secondary to cholecystitis, one to a duodenal ulcer and one to trauma. All five were operated upon and recovered. Chronic pancreatitis as a complication of biliary disease occurs more frequently than does acute pancreatitis.

The real purpose of this paper is to call attention to this group and report a method which we have found to relieve a certain percentage of those not completely relieved by operation. The report of the following cases will illustrate what is meant.

Female, widow, age 74. There was a history of attacks of indefinite, fairly severe, upper abdominal pain, accompanied by nausea and vomiting over a period of several years. A diagnosis of cholecystitis was made, but operation was not advised because of the age of the patient. The condition gradually grew worse so that cholecystectomy was advised and performed.

Following the operation the patient showed definite improvement, but at intervals still had upper abdominal pain, less severe than before and accompanied by nausea and vomiting. After a restudy of the patient by my associate Dr. Nelson, he found that there was incomplete fat digestion and concluded that the persistent symptoms were the result of a pancreatic lesion, secondary to the biliary disturbance.

The patient was placed upon a fat-free diet and was completely relieved of all symptoms for a few months. Then a considerable amount of butter was used at an evening meal and during the night the patient had another attack. Following this there were two subsquent attacks, all as the result of taking the fat. The patient then stayed on a fat-free diet for approximately a year, at the end of which time the fat was gradually added to the diet until she was consuming as much fat as other members of the household.

It has now been about five months since the fat restriction has been discontinued and there has been no evidence of any recurrence of symptoms. We are of the opinion that the symtoms were due to the incomplete fat digestion that were demonstrated by examination, and probably were being produced by some incomplete digestive products similar to the incomplete toxic products of protein digestion. The pancreas is now, we believe, functioning normally.

The finding of a thickening of the head of the pancreas in conjunction with gallbladder disease is an observation made by every surgeon. The interference with sugar metabolism has also been observed. In one of my cases there was a definite history of gallbladder disease and a very tender gallbladder continuously present. Sugar was found in the urine and operation not advised. Later, however, because of the frequency of the attacks, in spite of the presence of the trace of sugar, operation was advised and cholecystectomy with drainage was performed. The patient made a complete recovery and sugar disappeared from the urine.

In reviewing the literature I have not found any reports of a study of fat digestion in patients having persistent symptoms following operation for gallbladder disease. The patient reported was the first one diagnosed in our clinic. Since then we have observed others. In the most pronounced case the family reported that the stools were clay colored. Examination showed this to be due to the fat in the diet. The stool became normal in color upon a fat-free diet. This patient also recovered after being on a fat-free diet for some time.

I have been a little hesitant in making this report because I do not believe that persistent symptoms following operation on the biliary tract are going to be uniformly benefited by putting the patient on a fat-free diet, but I believe there are some patients who have persistent symptoms due to a deficient fat digestion because of pancreatic lesions. Patients of this group are benefited by a fat-free diet and I believe that most, if not all, will be cured by keeping them on such a diet for a period of one year.

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RECENT ADVANCES IN THE STUDY OF TUBERCULOSIS*

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Organized, correlated research in tuberculosis is a thing of very recent development in the United States. It is true that much very valuable study of this disease has been done in this country in the years since Koch's discovery of the causative organism, but it was accomplished by isolated workers and often in ignorance of similar studies being conducted elsewhere.

Under the leadership of Dr. William Charles White, of Washington, D. C., a plan was formulated a few years ago for correlated research in tuberculosis under the direction of the National Tuberculosis Association. This organization could not command the financial resources necessary to build and maintain laboratories and employ scientists to man them, so its leaders decided to utilize the existing facilities in universities and laboratories already available. By means of modest grants of money to assist in purchase of supplies or to employ an assistant worker, it has been possible to secure the cooperation of many of the finest institutions in the country in investigation of various phases of the tuberculosis problem. Different subjects for study are assigned to the participating agencies and intensive work is done by men who are authorities in their respective fields. Among the laboratories engaged in this research are those of Dr. Treat B. Johnson at New Haven, Dr. Esmond R. Long at Chicago, Dr. William Snow Miller at Madison, Wis., and the University of Pennsylvania.

Brief mention will be made of some of the most interesting of the important new developments growing out of this type of research.

1. Careful analytic study of the chemical composition of the tubercle bacillus has been going on for some years and is still in progress. It was found at the outset of this work that accurate analysis under proper chemical control and with uniform bacillary cultures had never been done. The bacilli used in these calculations are grown in glassware free from alkali, on a standard synthetic medium, and are collected in large quantities and carefully dried before being studied. The medium used is composed of asparagine, ammonium citrate, potassium acid phosphate, dry sodium carbonate, sodium chloride, magnesium sulphate, ferrous ammonium citrate, glycerol and water.

It has been found that 40 per cent of the nitrogen present in the tubercle bacillus is of the non-protein type which is soluble in water and apparently consists of nitrogen in combination with sugars and phosphoric acid. Among these compounds there are probably certain free amino-acids which the bacillus utilizes in synthetizing more complex substances during its own metabolic processes.

2. A revaluation of the role of the white blood cells in tuberculous infections has resulted from this correlated research. Phagocytosis has been regarded as a protective mechanism, directed by the body against infecting organisms. But in tuberculous infections this is not entirely true; on the contrary, the phenomenon of phagocytosis serves in part to protect the bacillus and to mobilize the infection.

Monocyte is a term applied to the white blood cells of the large mononuclear and transitional types. These cells do a large part of the phagocytosis of the tubercle bacilli. The blood serum has definite inhibiting and bactericidal powers against invading organisms but no such effect on its own blood cells. It has been found that the bacilli ingested by monocytes are protected from the antibodies in the serum, are provided with food substances and are transported by these ambulant cells from place to place in the body of the host. Those bacilli ingested by polymorphonuclear leucocytes appear, on the other hand, to disintegrate. But the intracellular protection of the bacilli by the monocytes is no doubt a large factor in the difficulty of chemotherapy in tuberculosis.

3. The course of experimental tuberculosis inoculations is another phase of this subject which has been carefully studied.

In intravenous inoculations the bacilli can be demonstrated to have passed through the entire circulatory system in a period of five minutes. Contrary to the former supposition, they are not filtered out in the lungs. Within twenty-four to forty-eight hours they have been removed from the free blood stream through the process of phagocytosis.

In subcutaneous inoculations the bacilli pursue a different route in the body of their host. They travel more slowly, first, to their regional lymph nodes, and then through the lymphatics to more central collections of lymphoid tissue. Eventually, after escaping fixation in the successive lymph nodes encountered en route, some of them reach the thoracic duct. From the thoracic duct they gain entrance to the right heart and the pulmonary circulation.

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Organisms that reach the lungs may be picked up by phagocytes in the capillaries or alveoli and carried to the tiny lymph nodules at the terminal branchings of the bronchi, from whence lymphatic drainage transports them to the hilum nodes. This whole process occupies only a few days. Of course, many of the bacilli are held in the successive lymph nodes they encounter, but some of them are usually able to proceed as far as the tracheobronchial nodes at the roots of the lungs.

4. Tubercle formation is another subject which has been carefully investigated. It is believed that the only bacilli fortunate enough to survive and multiply and produce disease are those which are ingested by a monocyte. At the site where this swollen, infected monocyte or group of monocytes lodge, there is a local proliferation of monocytic cells cast out from the blood vessels; this is the primary tubercle. About this little mass of cells a sort of granulation tissue is formed of fibroblasts and endothelial cells from the blood vessels adjacent. This granulation tissue forms a capsule about the infected area, through which no capillaries ever penetrate; thus the interior of the tubercle is an avascular lesion. Whatever interchange goes on between the tubercle and the blood-stream must do so through this capsule. This anatomic fact explains why these tuberculous lesions are so resistant to chemotherapy.

Microscopic study of fibrosed and calcified tubercles shows that in most of them there are continuous tissue reactions and cell proliferation in the capsular zone surrounding the central, avascular area. Often there are new tubercles forming in the vicinity of old healed lesions in persons entirely free from clinical manifestations of tuberculosis. There must be unknown, immunologic factors inhibiting such latent foci of infection, and disturbance of this immunity equilibrium must result in exacerbation of the infectious processes and clinical signs of disease.

5. The phenomenon of hypersensitiveness in tuberculosis is a very interesting one. Allergic conditions exist in the tissues of formerly infected animals. This is shown by the often-observed reaction to tuberculous inoculation by experimental animals. A guinea pig that has never had tuberculous infection will develop a systematic reaction without local manifestation upon inoculation with virulent bacilli, whereas one that has had a tuberculous process and recovered from it will promptly develop a furious local reaction at the site of inoculation and frequently show little or no evidence of general disease. This reaction is due to local tissue allergy in the previously infected animal. This tissue allergy is the basis of all skin-tuberculin tests, but it has the distressing defect of not differentiating past from present infections.

This tissue hypersensitiveness is also the source of many of the tuberculous patient's annoying symptoms, such as weakness, sweats, chills, anorexia and malaise. It is the basic factor in the production of necrosis and exudation about active lesions, and plays a leading role in the formation of pulmonary cavities.

6. A subject that has engaged much effort has been the distinction between juvenile and adult types of tuberculosis. The fact that, up to the age of sixteen years, about 25 per cent of tuberculosis is due to the bovine type of bacillus rather than the human is well known. It is also common knowledge that the characteristic childhood infection is likely to involve primarily bones or lymph glands, with other organs diseased either secondarily or terminally, whereas the typical adult infection involves the lungs first and spreads later to other viscera. But it has been a difficult matter to get a clear-cut idea of the distinction between juvenile and adult tuberculosis when the chest was involved in both cases.

It is believed that the primary, infantile infection in the chest occurs when the tubercle bacilli reach a bronchiole or alveolus, are there picked up by phagocytes and form tiny tubercles in the same vicinity. These small lesions often heal and entirely disappear, but while they are active they drain into the peribronchial lymphatics and the hilum nodes. The resulting reaction brings about the characteristic findings of peribronchial lypmhadenitis and enlargement of the tracheobronchial nodes. This is the so-called hilum tuberculosis of childhood. So far as chest tuberculosis is concerned, the only other forms of any importance are the diffuse lesions of miliary disease and the comparatively infrequent pleural and pericardial effusions of tuberculous origin (serous surface involvement).

The peribronchial and hilum type of tuberculosis described above does occur infrequently in adults. It causes definite clinical symptoms, may produce a bronchiectatic condition of the diseased area, or even give rise to sputum positive for tubercle bacilli. But the usual adult type probably represents a reinfection or lighting-up of the disease in a person who has already been infected in earlier life.

It is characterized by tissue allergy and violent local reactions wherever the bacilli localize, by a tendency to productive tubercle formation and necrosis of tissue, and by a countertendency to exudation in the vicinity of the active lesions. The more severe the local reactions due to hypersensitiveness of the tissues, the more marked the clinical symptoms and the sicker the patient.

All this means simply that in the adult type of chest tuberculosis the parenchymatous tissue of the lung is involved, while in the juvenile type the immediate vicinity of the original bacilli or the lymphatics and the hilum nodes are the areas of demonstrable disease. On this account, therefore, one is never justified in making a diagnosis of active pulmonary tuberculosis in an adult on the findings of thick, beaded bronchial shadows and enlarged hila in x-ray films.

While we consider all these important developments in the study of tuberculosis in our own country, we must not neglect the vital contributions that have come from Europe within the past few years. There is only time for me to mention two of these at this moment.

The first of these is a very essential factor in the therapeutics of tuberculous infections, especially in children. I refer to heliotherapy or ultraviolet light. Early in this century Dr. Rollier began to use sunlight in the treatment of juvenile tuberculosis among the mountains of Switzerland. His results were so good that many became interested in the new therapy and began to use it in various localities. It was first brought to this country and introduced in the sanatorium at Perrysburg, New York, near Buffalo, by Dr. Pryor. From there it has spread throughout almost all the sanataria in this country.

There has been much debate as to the relative merits of natural sunlight and artificial ultraviolet light. Most of the men living and practising in desert country and at high altitudes seem to prefer sunlight. But willy-nilly, many men working in cities and in damp climates are compelled to use the quartz-mercury or carbon-arc lamps as their sources of ultraviolet radiation. Clinically satisfactory results unquestionably follow the skillful use of either type of light.

The most spectacular results are obtained in bone, gland and intestinal tuberculosis and in pleural effusions. With intestinal and peritoneal involvement part of the benefit is undoubtedly due to the fact that these diagnoses are now made on the basis of x-ray examination with an opaque meal long before the onset of clinical symptoms. Ultraviolet radiation is now beginning to be used extensively in ischiorectal fistulæ and renal and genital tuberculosis as a substitute for surgery. It is helpful in many cases of pulmonary disease, but its use in these cases requires expert knowledge of the modality and extremely careful supervision of the treatment. It cannot safely be left to nurses or attendants.

One of the most striking cases of the effect of ultraviolet radiation I have seen, though far from being the most gratifying or important, was that of a child with a lumbar Potts' disease who developed two large psoas abscesses. These abscesses under no therapy except rest and ultraviolet radiation, calcified in situ without ever opening on the surface of the body or discharging.

Probably the most interesting thing now going on in tuberculosis circles in western Europe is the work of Calmette, Weill-Halle and Turpine on vaccination of infants against tuberculosis. Details are given from time to time by the Paris correspondent of the *Journal of the American Medical Association* as well as in tuberculosis reviews. So far their results have not been duplicated in this country, but that gives us no ground as yet for doubting the value of their studies.

Calmette's method of procedure is as follows: Infants in the first ten days of life receive the vaccine by mouth in doses of 1,200,000,000 bacilli. Almost all the infants treated have been in maternity hospitals at the time the vaccine was administered. Between 1924 and 1927 thousands of babies have been vaccinated in this way, preference being always given to the children of tuberculous parents. Thus far Calmette states that less than 1 per cent of these infants have developed clinical tuberculosis. Calmette himself is thoroughly convinced that blood-borne infection of the fetus often occurs intrauterine.

Recently Weill-Halle and Turpine, who were familiar with Calmette's method, decided to use the vaccine hypodermically in older babies. Up to the spring of 1927 they had thus vaccinated ten children, ranging in age from three weeks to nine months. For four weeks prior to the institution of the vaccine therapy they studied each child intensively for evidence of tuberculosis, using repeated clinical examinations and tuberculin tests. The dose they use consists of 10-40 million bacilli. They have observed no clinical reactions and no loss of weight following the vaccination. There is a local reaction which usually appears at the end of three weeks in the form of a subcutaneous nodule, sometimes accompanied by moderate regional enlargement of the lymph glands. Between thirty and forty days after vaccination, this nodule may develop into a small "cold abscess" and produce a serous discharge lasting a few weeks. Only a small scar remains after this abscess has healed. Within two or three months the infant's skin reaction to tuberculin, formerly a frank negative, becomes an equally frank positive.

The ten children Weill-Halle and Turpine have vaccinated by this method have now been observed for a period of two years. One of them has died from clinical tuberculosis. The other nine have lived with tuberculous parents continuously and are still free from demonstrable tuberculosis. Under such living conditions it is believed that at least half of them, had they been unprotected, would have developed tuberculous disease within this period. However, these men themselves consider that it is yet far too early to draw any definite conclusions as to the value or practicability of infant vaccination against tuberculosis.

With the impetus given to thoracic surgery during the World War, the surgical treatment of pulmonary tuberculosis has come into comparative prominence. Of the operations thus employed, thoracaplasty is probably the best known. This proceeding is simply a surgical method of compression of the diseased lung.

The rationale behind compression may be briefly summarized thus: Tissue products and secretions are mechanically removed by the pressure, and prevented from reforming by the lack of respiratory motion; the inflammation about the tubercles tends to subside; and fibrous tissue appears to form more rapidly, encapsulating the lesions.

The type of case suited to this procedure roughly amounts to about ten per cent of all pulmonary involvement. One must add to this those cases of persistent empyema, whether of tuberculous or nontuberculous origin. In other words, this operation is indicated in the same sort of case as pneumothorax, when "gas" cannot be used for one reason or another. In general, the outlook is more promising when the patient is under the age of forty-five and when the left lung is the one compressed.

The question of the good lung, so-called, is of particular interest. There is, of course, no such thing as a perfect contralateral lung. But the standard has been adopted that the lesions on the opposite side should not involve more than the upper lobe, should be stationary or nearly so under several months' observation, and should not include any open cavities.

There has been considerable difference of opinion as to anesthesia suitable for this operation. The European surgeons prefer general anesthesia and use ether without hesitation. The American operators, on the other hand, usually prefer nitrous oxide or ethylene, combined with local novocain. Whatever the anesthetic, narcosis must not be pushed to the point of abolishing the cough reflex.

In the surgical technic two points should be especially noted. The first rib must always be resected or at least divided to get any useful compression of the apex of the lung. All the ribs resected must be divided as closely as possible to the transverse processes of the vertebrae, using rongeurs to shorten the posterior stumps if necessary, Without this precaution, serviceable compression of even the lower portion of the lung cannot be obtained.

In his "Surgery of Pulmonary Tuberculosis" Alexander states that in his opinion the best plan in these cases is probably (1) phrenicotomy, followed in a few weeks by (2) paravertebral thoracoplasty of the upper seven ribs. If this does not give sufficient compression, after a few weeks more the seventh to eleventh ribs should also be resected in the same way.

This hasty and incomplete survey of the recent advances in the study and treatment of tuberculous disease may serve to emphasize the pitiful paucity of our present knowledge and the necessity of more light and more effort on our part if we are ever to master the White Plague.

THE DIAGNOSIS OF PULMONARY TUBERCULOSIS

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The diagnosis of early pulmonary tuberculosis in adults is rendered somewhat difficult because all lesions do not begin alike. Some are extremely small, while others are very massive when the disease first manifests itself clinically. The one may be overlooked for some time and the other may be considered too massive for beginning tuberculosis.

With our present knowledge of diagnosis, a great deal of emphasis must be placed upon symptoms, both past and present. The two symptoms that are most likely to be caused by tuberculosis are *pleurisy* with effusion and *hemorrhage* from the lungs. It is true that there are other causes for both of these symptoms but in each case presenting either of them, in the past or at present, one should seek most diligently for tuberculosis lesions. Symptoms referrable to the *gastrointestinal tract* should lead one to make a careful examination of the lungs, since the vagus nerve, after giving off branches to the pulmonary plexus, passes through the diaphragm to enervate some of the abdominal organs. Disturbance in a lung, therefore, may stimulate the branches from the vagus nerve in such a way that the impulses are carried reflexly to these abdominal organs. *Hoarseness* of the voice may also be brought about reflexly through stimulus of the vagus branches in the lung so that the impulses are carried to the larynx by way of the laryngeal nerves.

Other symptoms, such as daily *temperature* elevation (above 99° for men and above 99.6° for women), accelerated *pulse* (above 90 for men and above 96 for women), *cough, expectoration, loss of weight* and *loss of strength,* should cause one to suspect tuberculosis when other causes cannot be found. One must always look for foci of infection, such as those located in the paranasal sinuses, the gallbladder, teeth, tonsils, appendix, etc., since these so frequently cause symptoms which closely simulate those of tuberculosis.

The *physical examination* is quite important, yet there are tuberculosis lesions which cannot be detected by physical examination alone. In the past far too much emphasis has been placed upon the refinements of physical examination and many physicians have become discouraged and led to believe that only the most skilled diagnostician is capable of making a satisfactory physical examination of the chest. Of course, a careful physical examination should be made in each case but the most valuable findings are changes in *whispered voice transmission* and *moderately coarse rales persisting after cough.* One must not overlook *rigidity of muscles,* particularly those of the shoulder girdle, and limitation of the movement of one side of the diaphragm, all of which may be brought about reflexly by a small lesion. It is obvious that after a lesion is located some distance from the surface of the chest wall (good authorities say four centimeters), it is impossible to elicit physical signs by percussion and auscultation. Therefore, the *x-ray* examination has become very important.

The fluoroscopic examination is limited, in that it does not bring out clearly the finer details of pulmonary shadows. It is excellent for movement and position of the various organs, such as the heart. Excursion of the diaphragm, as well as its contour, can be most satisfactorily studied by the fluoroscope. It is very helpful in detecting artificial and spontaneous pneumothorax and the presence of fluid in the pleural cavity.

A single film of the chest may be of slight help, but stereoscopic films are far superior. In fact, for a careful study of the lungs for early disease, stereoscopic films are indispensible. One who takes x-ray films, however, should become familiar with the most modern technic, since much is being done to improve technic yearly and since films poorly prepared are almost worthless. One who interprets x-ray films should become familiar with x-ray interpretation, since it is a terrible injustice to the patient and the public to overlook a significant although slight lesion or to wrongly interpret an insignificant shadow.

Sputum and other suspected material should always be carefully examined in the laboratory for tubercle bacilli. It must be remembered, however, that the absence of tubercle bacilli in sputum proves nothing, but their confirmed presence is our strongest point in diagnosis. If bacilli are not found by the direct smear method or animal inoculation, one should repeat the examination frequently. Approximately two-thirds of the minimal (incipient) cases do not show tubercle bacilli in the sputum. If symptoms are present, although slight, and evidence of a lesion can be demonstrated either by physical or x-ray examination, treatment should be instituted at once even in the absence of demonstrable tubercle bacilli. The general methods now employed in the treatment of tuberculosis are also good for most nontuberculous pulmonary lesions. Therefore, the patient has been benefited, even if the condition should prove to be of a nontuberculous nature.

Tuberculin is very helpful in diagnosis. The epidermal (Von Pirquet) or the intradermal (Mantoux) test should always be a part of the initial examination. If these tests, particularly the Mantoux, are repeatedly negative, one is usually safe in stating that tuberculosis does not exist. If these tests are positive and there still remains a question as to whether a lesion demonstrated in the lung is active, the subcutaneous tuberculin test may be applied. If the initial dose consists of .5 of a milligram and subsequent doses of 2 mg, 5 mg. and 10 mg. are given at seventy-two hour intervals until a reaction appears, no harm is done the patient. If no reaction appears even with 10 mg. dose, one is usually safe in saying that there is not enough tuberculosis disease to require treatment at present.

NORTHWEST MEDICINE
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MEDICAL EDUCATION BY IRREGULAR SYSTEMS

In any field of human endeavor ineffective and deceptive exhibitions of assumed knowledge and proficiency, based on lack of knowledge and experience, can most thoroughly be disclosed and suppressed through means of impartial publicity. This was well demonstrated about twenty years ago, when superfluous and low quality medical schools were abolished in large numbers after exposure by the American Medical Association of facts concerning their organizations and methods of procedure. During the past year the Council on Medical Education and Hospitals of the American Medical Association has investigated every irregular borderline institution, professing to offer courses for those who are to practice the healing art in any of its branches. The report concerning schools of chiropractic and naturopathy have been completed. If the facts concerning these institutions were given sufficient publicity so that the general public were cognizant of their absurdities and deficiencies, there would be little confidence placed in these systems as methods of treating the sick.

During its brief career of thirty-two years, chiropractic has boasted of about one hundred and fifty schools, of which forty are still active. B. J. Palmer, the "developer" of the cult, has recently stated that forty-eight chiropractic schools have closed their doors during the past two years. Nominally four years or its equivalent of high school study is the requirement for entrance to the best of these schools. In reality, however, mature age, business experience or convenient achievement seem to be a satisfactory equivalent. While the majority claim to teach three school-years of six months each, there seems to be no requirement for persistent attendance. The student may enter any school day of the year and finish on the same day eighteen months thereafter.

The invariable equipment consists of a few adjustment tables, students' chairs and desks, some pieces of physical therapy or electrical apparatus, a few having x-ray machines. Eight of the schools have small chemistry laboratories, with simple equipment. None have laboratories for the sciences found in all medical schools. The faculties of all the schools comprise men of poor educational qualifications, mostly untrained in medical or nonmedical sciences or liberal arts. There is a general attitude of hostility to the most universally recognized public health facts and procedures of civilized life.

Naturopathy seems to be a sort of excrescence on chiropractic, with no basic idea other than in some way to broaden the scope of chiropractic. Their five schools all teach this latter system, with a nature-cure hodge-podge, antagonistic to the use of drugs. While they claim four years of high school for entrance requirements, no records are kept nor anything to demonstrate the students' qualifications. Only one school has day classes, and no outline of courses is published by any of them. They profess to teach a bizarre group of subjects, including sysmotherapy, glucokinesis, sphincterology, naprapathy, etc. The equipment is similar to that of chiropractic schools, comprising a few tables and a little chemistry but no laboratories for the sciences. Their teachers are untrained men, many being chiropractic products.

Thus it is observed that all of these forty-five schools possess a minimum of educational facilities and equipment, manned by teachers illy equipped and poorly trained to instruct others. Not one has a laboratory worthy the name, neither is there a clinic equipped with trained personnel or scientific apparatus for the diagnosis of disease. All owe their existence to the fact that they offer short cuts to the practice of medicine.

In the Northwest there are no naturopathy schools, but one chiropractic teaching institution is found both in Seattle and Portland. The Seattle College of Chiropractic, of about ten years existence, enrolled twenty-nine students last year, of whom ten were graduated. The course extends over eighteen months, instruction being given five evenings weekly of four hours each. The only subjects taught are those in which examinations are given in the basic sciences and by chiropractic boards. No catalogue nor faculty list is published.

There is a class room with fifteen chairs, a clinic room and business office with some adjusting tables but no physical therapy equipment. The faculty is said to consist of seven individuals, one a physician whose name, however, is not included in any of the city directories and seems to exist only in the mind of the secretary. One is said to be a senior at the state university. Three faculty members claim no educational equipment other than chiropractic. The student need not be a high school graduate and may enter classes any time during the first month. The tuition is $500.

In Portland is found Pacific Chiropractic College, Inc., organized in 1909. It occupies a two-story building, with accommodations for seventy-five students. Beside the treatment equipment there are a number of physiotherapy apparatus, also an x-ray laboratory and tables for dissection work. The faculty consists of four instructors. The dean, a Greek, Checkos by name, claims to have been graduated from the National University of Athens, his record showing a somewhat checkered career. There were said to be one hundred students last year, which seems to be quite a burden for thorough instruction at the hands of four instructors. Forty-two of these were graduated. The curriculum is said to extend over twenty-eight months, three hours of work being offered for five days or nights weekly. The array of subjects said to be taught includes all the branches of a first class medical school, besides the great and all-inclusive subject of chiropractic itself. This mighty effort looks like a well executed bluff on the public, all of which is imparted for the modest sum of $750 in tuition.

Probably there will never be an end to new and fantastic modes of treating the sick. Anyone with abundant assurance and loud-mouthed denunciation of existing methods will find a large and compliant audience, prepared to receive and adopt any new method for the treatment of human ills. If the prevailing Hindu system of treating sickness with cow dung and urine were advocated with the confidence and enthusiasm of followers of existing cults, its advocates might even secure legislative sanction this procedure as a legal method of drugless healing. Let us be thankful that a large modicum of citizens keep their feet on the ground and sanely view established facts.

EARLY DIAGNOSIS OF TUBERCULOSIS

The older generation of physicians will recall the period when tuberculosis was generally considered a hopeless disease. Victims of this infection were commonly kept at home near the fire, fearful of the chilling effect of fresh air, awaiting as peacefully as possible the inevitable termination of the disease. In a large proportion of the cases pulmonary infection was not recognized until advanced to a condition which would now be considered beyond the stage of repair. The accepted viewpoint towards this disease at the present day is one of the most striking revolutions in the diagnosis and treatment of disease. The hope and prospect of improvement which is now held out to the tuberculous patient is one of the greatest boons for the afflicted which has developed in the latter day progress of medicine. This benefit, however, is universally recognized as depending upon early diagnosis of the disease. Even at the present day there are unfortunately too many physicians who ignore or disregard this absolute necessity as a preliminary for arresting this infection.

Under the auspices of the National Tuberculosis Association the month of March is being devoted to an educational propaganda to arouse an active, widespread interest in the early diagnosis of tuberculous infection. The various state tuberculosis organizations, in conjunction with the county leagues, are carrying on an educational program to impress upon the public the necessity of recognizing the early symptoms of this disease. In addition to lectures and demonstrations before the general public, the early diagnosis campaign is being presented in the schools for the purpose of arousing interest in the rising generation.

Among the requirements of state departments of health is that which makes tuberculosis a reportable disease. This regulation is commonly not followed by the medical profession, who are supposed to report such cases, as is evidenced by the records in Washington. It is the rule that there are nine active cases of tuberculosis for each death. In Washington it was reported that in 1926 one thousand and fourteen persons died from tuberculosis. During that time only two thousand and ninety-four cases were reported to the State Department of Health. It is clearly obvious, therefore, that physicians of the state for the most part failed to observe the health requirements regarding reporting patients with this disease. Presumably the same condition exists in other states. If the medical profession would systematically instruct their patients as to a few simple facts suggesting early tuberculous diagnosis, they would accomplish more for the recognition of this disease than all the lectures and other methods of instruction which are being imparted to the public. This is an opportunity for every practitioner to do his part for an important public service.

IDAHO MEDICAL MESSENGER

The first two issues have been received of the monthly bulletin published by the Idaho State Medical Association, entitled *Idaho Medical Messenger*. The Public Health League has been functioning for a number of years as an independent organization, supported chiefly by interested members of the profession. At the last annual meeting of the state association, it was voted to merge the two organizations into one and to employ a full-time secretary to carry on the various activities of this consolidation. In order to provide suitable funds an annual membership of $60.00 was established which, it is expected, will be reduced in proportion to the number of members joining the association.

The League has already accomplished notable results for the medical profession and public health interests of the state of Idaho. Future work is contemplated, both from legislative action and from interest of the public, which will place this state among the foremost in the establishment of public health measures. The Messenger will be the medium for direct communication with the members concerning all matters affecting their professional interests. They are requested to express their views on all subjects, with the assurance of a minimum employment of the blue pencil on the part of the editors. The Idaho profession is to be congratulated on the establishment of this publication. The program for the future of medicine and public health movements which have been inaugurated in this state should receive the endorsement and financial support of the whole profession. Other states will observe with interest the outcome as reported from month to month in the official bulletin.

A HEBREW MEDICAL JOURNAL

The initial issue of *The Hebrew Physician* has been received, said to be the only medical journal published outside of Palestine which is written in Hebrew. It is published under the editorship of Drs. Moses Einhorn and A. Goldenstein of New York. It is stated that the articles pertain to general medical subjects, with a special section devoted to new Hebrew terminology.

Like the writing of books in general, there seems to be no end to the birth of new medical journals. There appears no apparent demand for a medical journal in this country published in the Hebrew language. New York City, with the largest Jewish population of any city in the world, may have some physicians unfamiliar with the English language, for whom a journal published in Hebrew might be useful. It would be a patriotic duty, however, for their brother physicians to instruct them in the language of their adopted country, and abandon the necessity of a foreign language being used for their edification. The contents of this journal may present valuable medical information which has not been deciphered at this writing. This publication is not of a character to excite much interest in the mind of the average physician, though as a curiosity and medical novelty it may be attractive to certain individuals.

PAN-PACIFIC SURGICAL CONFERENCE

It is planned to hold a Pan-Pacific Surgical Conference at Honolulu in 1929, under the auspices of the Pan-Pacific Union. The purpose of this organization is to cement friendly relationships of the many scientific organizations represented by the various countries bordering on the Pacific Ocean. Thus it is hoped to prevent misunderstandings, particularly among scientific men in all walks of life. These conferences are both scientific and social. The physicians and surgeons of the Islands are anxious to make this first surgical conference a great success and well in advance are laying their plans to that end. This announcement is made at this early date in order that physicians of the Northwest may have it in mind for their future vacation plans for the following year. Further information concerning the meeting will be duly presented.

ANNUAL HOSPITAL MEETING

The thirteenth annual convention of the Catholic Hospital Association of the United States and Canada, and the Second Annual Hospital Clinic Congress of North America, will be held at Cincinnati, Ohio, June 18-22. The fourth annual convention of the International Guild of Nurses will be held at the same time. The program will include general scientific meetings, special demonstrations of hospital departments, with extensive commercial and educational exhibits. Lectures will be delivered by leading authorities in various branches of medical and hospital affairs, with specially planned clinics representing various departments of the modern hospital. Further information may be obtained from Dr. John R. Hughes, Marquette University, Milwaukee, Wisconsin.

PACIFIC NORTHWEST MEDICAL ASSOCIATION

Preparations for the meeting of Pacific Northwest Medical Association in Tacoma are well under way. Headquarters will be the Winthrop Hotel, where two large meeting rooms have been engaged and will be used for the sessions, a joint meeting in the morning and sectional meetings in the afternoon and evening. The date of the meeting will be July 5, 6 and 7, Thursday, Friday and Saturday. The hotel has promised to accept reservations for rooms in the order in which they are received to the limit of its capacity, and for those who are willing to accept such accommodations cots will be placed either in rooms already occupied, if the occupant will give consent, or in dormitories set aside for the purpose. Other hotels will cooperate to the fullest of their ability.

The program which is practically complete at this time, except for titles, offers a variety of splendid subjects by teachers and research men of ability.

The following speakers have accepted, and so far as possible the titles are given:

PROGRAM

Dr. Tom Addis, Professor of Medicine, Stanford University Medical School, San Francisco.
1. The Diagnosis of Bright's Disease.
2. The Etiology and Prognosis of Bright's Disease.
3. The Treatment of Bright's Disease.

Dr. Walter C. Alvarez, Mayo Clinic, Rochester, Minn.
1. Practical Points in the Diagnosis of Gastrointestinal Disease.
2. New Work from the Laboratories.

Dr. Isidore Cohn, Professor of Clinical Surgery, Tulane University, New Orleans.
1. Injuries and Infections of the Hand.
2. Contusions and Sprains.
3. Osteomyelitis.

Dr. Carl A. Dragstedt, Professor of Pharmacology, Northwestern University Medical School, Chicago.
1. The Present Status of the Adrenal Problem.
2. Experimental Studies in Intestinal Obstruction and Intestinal Toxemias.
3. The Relation of the Parathyroids to the Healing of Bone Defects.

Dr. Leo Eloesser, Clinical Professor of Surgery, Stanford University Medical School, San Francisco.
1. Treatment of Pulmonary Suppuration—Abscess.
2. Treatment of Pulmonary Suppuration—Bronchiectasis.
3. Some Forms of Gangrene of the Extremities and their Treatment.

Dr. Charles A. Elliott, Professor of Internal Medicine, Northwestern University Medical School, Chicago.
(Titles unannounced.)

Dr. Ludvig Hektoen, Professor of Pathology, University of Chicago and Rush Medical College, Chicago.
Three talks on Practical Applications of Immunology.

Dr. J. C. Litzenberg, Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis.
(Titles unannounced.)

Dr. Frank C. Mann, Mayo Clinic, Rochester, Minn.
(Titles unannounced.)

Dr. J. C. Meakins, Professor of Medicine, McGill University, Montreal.
1. The Significance of Symptoms in Circulatory Disease.
2. The Pathology and Clinical Course of Subacute Bacterial Endocarditis.
3. Recent Advances in the Knowledge of Icterus and Their Clinical Significance.

Dr. Dallas B. Phemister, Professor of Surgery, University of Chicago Medical School, Chicago.
1. Correlation of Pathological and X-ray Studies in the Diagnosis of Bone Tumors.
2. Unusual Forms of Osteomyelitis.
3. Causes and Treatment of Circulatory Collapse in Surgery.

Dr. W. F. Reinhoff, Associate Professor of Surgery, Johns Hopkins Medical School, Baltimore.
(Titles unannounced.)

Dr. Carl J. Wiggers, Professor of Physiology, Western Reserve University, Cleveland.
(Titles unannounced.)

These speakers constitute an incomparably good list of lecturers for any medical meeting and the attendance should be large.

MEDICAL NOTES

OREGON

Internists Meet. The semi-annual meeting of the recently organized North Pacific Society of Internal Medicine was held at the University Club, Portland, Jan. 28. Among the topics discussed were blood stream infections and affections of the coronary arteries. At the close of the program the guests were taken to the University of Oregon medical school, where Dr. Robert S. Benson, professor of pathology, gave a demonstration of museum specimens illustrating coronary occlusion. Dr. Frederick Epplen, Seattle, is president of the society, and Dr. Lester Palmer, Seattle, secretary.

Quack Loses Lawsuit. A judgment of $8691.16 was returned against Chas. J. Dean, Inc., in a suit brought recently into Circuit Court at Portland by Gus Emrick. The plaintiff alleged that he had been injured by Dean and his associate while undergoing treatment at the hands of the self-styled "rectal specialists."

Construction of Veteran's Hospital Begun. The breaking of ground Feb. 8 at the site of the proposed new United States Veterans' hospital, Portland, was made the occasion for appropriate ceremonies. Dr. Cyril G. Manning, a disabled world war veteran, turned the first spadeful of earth. Among those who made addresses were Governor L. L. Patterson, Major William H. Radcliff, superintendent of construction for the veterans' bureau, and Dr. W. C. Gibson, who will become superintendent of the new institution. When completed, this hospital will form the latest addition to the developing medical center in Portland. Other institutions already in operation at the Marquam Hill site are the University of Oregon Medical School, the Portland City and County Hospital, and the Doernbecker Hospital for children.

New Society Organized. The Portland Society of Obstetricians and Gynecologists was formed on February 8. The society is composed of physicians who limit their practice to gynecology or obstetrics or both. It has for its purpose the promotion of knowledge relating to gynecology and obstetrics. The following officers were elected: President, Dr. Albert Mathieu; vice-president, Dr. E. J. Labbe; secretary, Dr. Albert Holman; treasurer, Dr. Goodrich Schauffler; pathologist, Dr. Karl Martzloff. Other members are: Drs. C. J. McCusker, Allen Noyes, Eugene Steinmetz, Robert Ellis, T. W. Adams, and Raymond Watkins.

Information on Tuberculosis "Line" Withheld. Dr. George Kirkpatrick, Portland veterinarian-chiropractor, recently declined to reveal the ingredients contained in his alleged tuberculosis remedy, "Pul-Bro-Tu." He did, however, deny that the preparation contained arsenic as had been claimed by the American Medical Association, following its official analysis.

Expert on Cancer Is Visitor. Dr. Raymond Voorhees Brokaw, New York City, field representative of the American Society for Control of Cancer, recently spent several days in Portland in conference with Dr. J. Earl Else, state chairman of the society, and with other physicians and public health officials who are actively engaged in the campaign against malignant diseases. Dr. Brokaw stated that cancer now ranks third in the causes of death in the United States, one hundred thousand people succumbing to it annually.

County Physicians Appointed. Dr. W. Carlton Smith of Salem has been appointed Marion County physician to succeed Dr. W. H. Byrd, who has resigned on account of ill health. Dr. Vernon A. Douglas has been made county health officer and camp inspector.

Dr. Wesley E. Gatewood, formerly associate professor of medicine in the College of Medicine of the State University of Iowa, has recently moved from Iowa City to Portland. He is affiliated with the Medical School of the University of Oregon and in private practice is associated with the Else-Dudman-Nelson Clinic.

Dr. Richard P. Landis, formerly of La Grande, has located for practice in Portland.

WASHINGTON

New Tacoma Hospital Planned. The Federated Lutheran Brotherhood of the district of Tacoma, at a meeting Feb. 2, determined to proceed with plans for the construction of a Lutheran hospital in that city. A meeting will be held in April, at which time a Lutheran hospital association will be formed for the purpose of instituting a building campaign. It is proposed to invest an ultimate outlay of $1,000,000 for the new hospital, whose capacity will be two hundred beds. The institution is to be built in units, the first of which will provide at least one hundred beds.

Eagleson Memorial Planned. A proposal was made recently by the editor of the Seattle Times, that the citizens of Seattle should honor the memory of the late Dr. James B. Eagleson by the erection of a suitable community hospital bearing his name. There has been an enthusiastic response to this suggestion, both from the medical profession and from prominent representatives of the laity. It seems probable that a definite plan will be evolved in the near future. Several citizens, who have given serious thought to the matter, believe that the new City-County hospital, whose construction is now under consideration, would be the most fitting memorial to Seattle's most distinguished pioneer physician. Others see an opportunity for several private hospitals, which have recently announced tentative plans for expansion, to combine their efforts in the form of a single large community hospital in memory of Dr. Eagleson.

New Hospital in Ballard. Under the supervision of two registered nurses who are to manage the institution, a portion of one floor of the new Eagle building in Ballard, Seattle, is being converted into a modern thirty-five bed hospital.

Sunnyside Hospital to be Reopened. The Sunnyside Commercial Club, together with the physicians of the community, have pledged themselves to support the Sunnyside hospital when it is reopened. The institution has been closed for a number of months on account of lack of support.

Spokane to Have New Medical Building. The August Paulsen estate has announced plans for the construction of an eight-story, fireproof medical-dental building on the present site of the Granite building at Riverside Avenue and Washington Street. A garage will be included whose facilities will also be open to the tenants of the Paulsen building. It is planned also to include a modern surgery and an auditorium for the use of doctors and dentists occupying the building.

May Drugless Healers Sign Death Certificates? Sanipractors claim to have won a victory in their attempt to gain for themselves the right to sign death certificates, according to an article appearing in the Spokane Chronicle Jan. 31. In December, 1927, Dr. Ralph Hendricks, city health officer of Spokane, informed local undertakers that certain drugless practitioners, whose state licenses had been revoked, were not eligible to sign death certificates. A sanipractor, O. G. Carroll, claims to have nullified the order in his own case, by securing a statement from George L. Berger, assistant in the office of the State Director of Licenses, to the effect that he is still in the possession of a "partial sanipractic license." The drugless healers, according to Carroll, feel that they are being discriminated against, and expect to make a test case to settle the question definitely.

North End Medical Society of Seattle held its annual banquet at the Wilsonian Hotel Feb. 9. Forty guests were present. Dr. Trevor Kincaid, professor of zoology at the University of Washington, gave an illustrated lecture on "Protective Colonizing of Animals."

Seattle Orthopedic Society held its annual clinics Feb. 24-25. As a guest of the society, Dr. H. Winnett Orr, professor of orthopedic surgery, University of Nebraska, Lincoln, Neb., conducted clinics in the Medical and Dental Building and at the Virginia Mason hospital. At the annual dinner, which was held at the Olympic hotel at the conclusion of the meetings, he delivered an address upon the "Treatment of all Types of Bone Infection."

Chelan County Medical Society held a meeting at Wenatchee January 18, at which the following officers were elected for the ensuing year: President, S. A. Keim; vice-president, E. J. Widby; secretary-treasurer, John E. Gahringer; board of censors, Chas. Conway, R. H. Finley, E. Hayden.

Pierce County Medical Society held its annual dinner at the Union Club, Tacoma, February 7. There was a large attendance of physicians and their wives. The principal speaker was Major W. H. Cross, mining engineer and lecturer, who has spent many years in China. He delivered an interesting address on Medicine in China.

Represents Shriners' Hospital. Dr. Mitchell Langworthy, chief surgeon of the Spokane unit of the Shriners' hospital for crippled children, attended a meeting of the national trustees of the Shriners' hospital in St. Louis, Mo., Feb. 10-11.

Lewis County Medical Society, at its meeting in Centralia Feb. 13, was addressed by Mr. L. B. Donnelly of Olympia, assistant state attorney-general. He spoke upon the subject of the practice of medicine from a legal standpoint.

Dr. L. G. Steck, formerly of Seattle, has purchased the practice of Dr. R. E. Smith at Centralia. Dr. Smith intends to return to the vicinity of Puget Sound.

Dr. T. W. Laraway, who formerly practiced in Douglas county, has moved to Valsetz.

Medical Weddings. Dr. James G. Mathews of Spokane and Miss Dorothy McCoy Simmons of Chicago were married Feb. 1 at Miami Beach, Florida. Dr. Douglass Bell of Spokane and Miss Ruth Lovern of Pueblo, Colo., were married at Pueblo Jan. 10.

IDAHO

Attends Conference. Dr. W. F. Passer of Twin Falls attended the annual Conference of Medical Education and Hospitals, which took place in Chicago in February. He was appointed by Secretary of State Fred E. Lukens to serve as official delegate from Idaho.

Idaho Falls Medical Society held its regular monthly meeting Feb. 3 at the Hotel Bonneville. Dr. Joseph I. Tyree of Salt Lake City, Utah, was the guest of honor. He addressed the members on "Some Phases of the History and Treatment of Arthritis."

South Side Medical Society at a recent meeting elected the following officers for the ensuing year: President, J. F. Schmershall, Jerome; vice-president, E. H. Gilmore, Rupert; secretary-treasurer, G. C. Halley, Twin Falls.

Pocatello Medical Society has elected the following officers for 1928: President, W. W. Brothers; vice-president, C. P. Groom; secretary, O. F. Call; treasurer, W. F. Howard.

Appointed Medical Adviser. Dr. F. W. Almond of Boise has been appointed consultant medical adviser to the Idaho department of public welfare in place of Dr. R. M. Fouch, who has recently resigned and located for practice at Huntington, Ore.

Medical Wedding. Dr. Brooks Horsky of Wallace and Miss Helen Fortney of Toledo, Ohio, were married in Spokane, Wash., Jan. 23.

OBITUARIES

Dr. Norman S. McCready died at Snohomish, Wash., July 19, 1927, aged 69 years, of myocarditis from which he had suffered for about one year. He was born in New Brunswick May 11, 1858. He graduated from Detroit Medical College in 1889. He located immediately in Snohomish where he practiced until his death. For two years in the middle nineties he was county physician and recently was for six years physician to the state reformatory at Monroe.

Dr. Edward P. Heliker, Seattle, Wash., died at his home in Ballard, February 10, following a brief illness, aged 63 years. He was born in Brooklyn in 1865 and was graduated from Long Island College Hospital, Brooklyn, N. Y., in 1890. He had made his home at Ballard for the past twenty-two years, but had devoted a large portion of his time to professional work in mining districts, principally at Carbonado.

Dr. Thomas H. Grosvenor of Wenatchee, Wash., died December 11, 1927, aged 53 years, from cerebral hemorrhage. He was attacked while about to enter St. Anthony's hospital. He was born at Marshalltown, Iowa, June 22, 1874. After graduating from the state normal school at St. Cloud, Minn., he taught school at Grand Maris, Minn. After studying at the University of Wisconsin, he taught English at the state normal school at Lakeville, Minn., and then was head of the English department of the state normal school at Mayville, N. D. He received his medical degree at Northwestern Medical School, following which he was intern at Cook County hospital, Chicago. He began practice at Wenatchee in 1909, continuing there until his death. He was a prominent physician as well as a leader in civic affairs of his city. He was a student of geology and a collector of specimens of the geological formations of Northern Washington. His death was a great loss to that section of the state.

Dr. Charles F. Riggs, Spokane, Wash., died suddenly at his home February 22, aged 47 years. He was born at Stratford, Ontario, in 1880, and was graduated from the Eclectic College of Indianapolis in Indianapolis, Ind., in 1908. He located shortly afterward in Spokane and practiced there continuously until his death.

Dr. Etta Hill Schauffer, Los Angeles, Calif., died in that city in January, following an attack of heart disease, aged 62 years. She was born in 1866, and graduated from Willamette University Department of Medicine in 1895. She practiced continuously in Portland, Ore., until 1920, when she moved to Los Angeles.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., E. L. Zimmerman; Secty., C. E. Hunt

Central Willamette Medical Society held a meeting Feb. 2 at Hotel Benton, Corvallis, preceded by a banquet. Thirty-five members were present.

PROGRAM

Dr. E. A. Sommers, of Portland, read a paper, "Internal Derangements of the Knee Joint." Discussion was opened by Dr. W. B. Neal, of Eugene.

Dr. T. Homer Coffen, of Portland, read a paper, "Acute Indigestion in Relation to Heart Disease." Discussion was opened by Dr. Bosworth, of Corvallis.

PORTLAND CITY AND COUNTY SOCIETY

Pres., C. J. McCusker; Secty., E. W. St. Pierre

Portland City and County Medical Society held a meeting at the Portland Women's Club building Feb. 1.

Dr. Homer Coffen addressed the society on the subject of "Acute Indigestion and Heart Disease."

Dr. L. H. Bittner, ex-medical missionary, gave an illustrated lecture upon his experiences in the treatment of leprosy and yaws in Java.

At the meeting of the society February 15, Dr. Albert Mathieu read a paper on "Use of Lipidol as a Diagnostic Aid in Gynecology."

Dr. T. W. Adams discussed "Office Use of the Electric Cautery in Gynecology."

Dr. J. B. Bilderback, Portland, sailed from New York Feb. 2 for a three months cruise of the Mediterranean.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

A General Meeting of the King County Medical Society was held in the Auditorium of the Medical-Dental Bldg., on the evening of February 6, with President D. C. Hall in the chair. One hundred thirty members were present. Minutes of the general meeting of Jan. 9 were read and approved. Application for membership was presented from Dr. W. H. Orr.

President Hall discussed some of the important medical matters to be considered in the near future. He mentioned the impossibility of a medical school in connection with the University of Washington for a period of years. There will be no large revenue to the University for at least twenty-five years, when the buildings on the Metropolitan tract will revert to it. Unless bequests from private individuals were received for that purpose, there will be no prospect of a medical school being established. A two year premedic course is now being given at the University, although no credit is given it at medical schools.

Dr. O. S. Proctor read a paper, "The Surgery of Pulmonary Tuberculosis." Pneumothorax was discussed and indications given for its employment in suitable cases. He mentioned contraindications and cases in which it is likely to be a failure. Phrenicotomy was considered, which can be performed under local anesthesia. Paralysis of one-half of the diaphragm is immediate and its higher position in the chest serves to compress the lung. Its indications are many and useful where more formidable steps are inadvisable. It may be of advantage as an aid to artificial pneumothorax. It may aid in checking persistent hemoptysis. This is performed prior to thoracoplasty by many surgeons. Thoracoplasty is useful where adhesions make pneumothorax impossible. Indications for its use were presented with details as to its execution. The paper was discussed by Drs. Doolittle, Slyfield and Woodford.

Dr. Roger Anderson presented a paper on "Newer Methods of Treatment of Fractures of the Femur." His conclusions were derived from a study of seventy-one private cases, involving various fractures of these bones. Details of reduction and application of apparatus were given. Nonunion was rare. Delayed union was most common in neck fractures. Average shortening was a little over one-half inch. The relief of subtrochanteric fracture is most difficult. Various methods of treating fractures of the neck and trochanteric regions were discussed. Methods of treating fractures of the shaft were discussed in detail. The paper was discussed by Drs. L. L. Goodnow, Aberdeen, and M. C. Lyle, Seattle.

The Medical Section of King County Medical Society held a meeting Feb. 13 in the auditorium at the Medical-Dental building.

PROGRAM

Dr. Moritz Weber, formerly of Berlin, now of the University of California, delivered a lecture on "Osteodystrophia Fibrosa, Clinical and Pathological Aspects, Etiology and Experimental Reproduction," with an outline showing the newer developments in the study of this condition. It is a tumultuous rebuilding of bone, with an excess of giant cells and definite signs of lacunar absorption associated with new generation of fibrous tissue in the medulla. According to Frangenheim, there are three groups of this condition, the congenital, the juvenile-adult and the senile. The juvenile-adult type may be circumscribed or generalized. To the circumscribed type belongs the "thick skull," leontiasis ossea, and certain bone cysts.

Normal histology of bones was described, many slides being shown illustrating recent research work. In advanced cases of osteodystrophia fibrosa there is laid down between the Haversian systems a mosaic pattern which can be demonstrated many years afterwards. This is one of the characteristics distinguishing this disease from osteomyelitis. Epulis and brown tumors of the bone belong to this group.

The differential diagnosis was considered between syphilis and osteodystrophia fibrosa in a single diseased bone. The latter may be definitely diagnosed which is not characteristic of syphilis. Syphilitic bone affection is primarily a periosteal process extending from the bone inward, while osteodystrophia fibrosa is of inward origin, extending outward. Roentgen ray and lantern slide pictures illustrated the differentiation.

Dr. Harry Kretzler, of Edmonds, read a paper on "The Bicentennial of John Hunter." This was a short sketch of his life, briefly reviewing the work which he accomplished, showing various branches of surgery in which he was a pioneer.

SKAGIT COUNTY MEDICAL SOCIETY

Pres., S. W. Holton; Secty., C. W. Crompton

Skagit County Medical Society held a meeting at Burlington Feb. 2, with Dr. S. W. Holton of Sedro-Woolley in the chair.

Dr. Oscar S. Proctor of Seattle was the guest of honor. He gave an address, illustrated by slides and moving pictures, on the subject of "Recent Developments in the Surgery of Pulmonary Tuberculosis."

Election of officers of the society for 1928 resulted as follows: President, Dr. Austin Shaw; secretary, Dr. S. G. Brooks, both of Anacortes.

SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., H. T. Rhoads; Secty., W. J. Bell

Snohomish County Medical Society held a meeting at Everett Feb. 7, to which the public was invited.

The program was devoted to a consideration of child welfare work. Dr. S. E. Doolittle, of the Seattle Municipal Tuberculosis hospital at Firlands, made an address on the differential diagnosis between tuberculosis and malnutrition.

PNEUMOCOCCUS MENINGITIS. Joseph Harkavy, New York (*Journal A.M.A.*, Feb. 25, 1928), reports the case of a woman, aged 57, who recovered from pneumococcus meningitis with serum therapy. He believes that from a survey of the literature it is difficult to state definitely that any one method of treatment is the method *par excellence*, nor does the experience acquired in one case justify any broad generalization. Yet his own clinical observations and those of others would lead one to the following conclusions: The early diagnosis and the identification of the invading organisms is of supreme importance. Specific serum therapy employed should be definitely potent and should be promptly instituted. The serum should reach all foci of infection in the subarachnoid space.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

BEDSIDE DIAGNOSIS. By American Authors, edited by George Blumer, M.D., Clinical Professor of Medicine, Yale University, School of Medicine; Attending Physician to the New Haven Hospital. Three Octavo volumes, totalling 2820 pages, containing 890 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $30.00 a set. Separate desk index volume free.

This is a very elaborate and comprehensive treatment, perhaps never before attempted on such a grand scale in English. It is written by sixty-four American diagnosticians and edited by the Clinical Professor of Medicine of Yale University Medical School, so that it has a great weight of authority behind it. But this very weight involves a certain danger unless it be so beautifully proportioned that the structure as a whole may stand the test of time and use. The arrangement of the book is that followed in textbooks of medicine and is not based on the chief presenting symptoms, signs or pathologic conditions as in many classical treatises on diagnosis. It is a textbook of medicine, in which the text is restricted to symptoms, signs, laboratory findings and diagnosis. Differential diagnosis is of course included but is not more stressed than in other works on practice.

Having so many authors the matter is unevenly proportioned as to quantity, quality and style. The difficulty of coordinating the work of so many authors must be great in apportioning the space to the value of the subject. Thus there appears to be no article in any of the volumes on tuberculous meningitis, although in differential diagnosis it is mentioned in several different parts of the treatise. In respect to space in reference to importance of the subject, a page and a half are devoted to infectious catarrhal jaundice, and almost ten pages to tularemia. The principal diagnostic features in catarrhal jaundice are noted as three: (1) The presence of similar cases in family or community, (2) occurrence in a child or young adult, especially in summer or fall, (3) an acute febrile gastrointestinal upset followed by jaundice. Then a few lines are given to differentiate it from the Japanese spirochetal jaundice, simple sporadic jaundice, cholecystitis, cholelithiasis and yellow fever. In respect to cholelithiasis and cholecystitis it is only said that: "These diseases are not seasonal, they occur especially in older people; there is usually a history of previous attacks of biliary colic; in short the resemblance is only superficial."

It would seem that there are few conditions causing more difficulty in diagnosis than painless jaundice and that its frequency and importance demands much more consideration in a work of this magnitude devoted to diagnosis. There are not a few cases of apparent catarrhal jaundice in adults that continue for two or three months and require all one's wisdom to differentiate between stone, new growth or various forms of organic liver disease; and what seems an innocent catarrhal jaundice in a child may suddenly terminate fatally in necrosis of the liver. Osler says of catarrhal jaundice: "There are instances in which time alone can determine the true nature of the disease." To the reviewer who has suffered from much anxiety as to diagnosis in so called "simple" catarrhal jaundice, a complete discussion of the diagnosis would be most gratifying.

There is a comprehensive review of liver function tests by Tileston who states, in connection with Rosenthal's bromsulphalein test, that "in the late stages of cirrhosis it is always positive." Evidently the author has not had the experience of the reviewer who found that this test was negative in three cases of atrophic cirrhosis of the liver, even when used shortly before death. The diagnosis in these cases was confirmed by autopsy and examination by a pathologist. The same may happen in cancer of the liver because there is enough liver tissue functioning to nullify the value of the test when it is negative. Sixty pages are devoted to the diagnosis of congenital cardiac diseases by Abbott and Weiss, a most able and scientific presentation of this difficult subject by well known authorities. This space would not be excessive to allot to such a subject, if a positive diagnosis could be made by any kind of description or exposition, but we believe that a diagnosis during life is impossible in many, if not most cases of congenital heart anomalies, having in mind autopsy experience, especially in reference to one instance in which there was but one ventricle. O'Hare's discussion of the diagnosis of the various types of nephritis is to be highly commended because of its simplicity and clarity.

In the discussion of diagnosis of bronchiectasis by Landis there is no mention of the most important and by far most valuable method of diagnosis, which often cannot be made by x-ray alone, and that is the use of bronchoscopy and lipiodol which will bring out the bronchiectatic area most beautifully in the skiagram. The same remarks apply to the article on lung abscess but here the editor has inserted a foot note suggesting lipiodol. There is no article on intrapulmonary tumors, and but a very general one on intrathoracic tumors and the method of making a positive diagnosis of tumor by bronchoscope is not noted, although this is the method *par excellence* in tumor of the lung as a specimen may be removed for microscopic examination.

It is very easy for anyone to criticise portions of a work so enormous and the reviewer feels a little uncomfortable in appearing unnecessarily captious. The essence of the diagnostician is a critical attitude of mind and desire for truth. This work is composed of numerous monographs of great but varying excellence as must necessarily follow when written by sixty-four authors. It is therefore lacking in uniformity of style, composition, and in the degree of consideration given to subjects according to their relative importance. It is a question also whether the presentation of a work on diagnosis similar to that found in textbooks, only with greater amplification, is superior to the books on clinical diagnosis based on the presenting symptoms, signs or chief pathologic manifestations. WINSLOW.

THE ENDOCRINES IN GENERAL MEDICINE. W. Langdon Brown, M.A., M.D., F.R.C.P.; Professor of Medicine, University of London. Cloth, 144 pp. $3.00. Paul B. Hoeber, Inc., New York, 1927.

The origin and biologic development of the endocrine system is discussed in an attempt to show the structural and functional relationship of the endocrine glands to one another and to the autonomic nervous system. The explanation of the physiologic action of the endocrine system is based on the theory of cooperation between the parathyroids and pancreas on the one hand, and the adrenals, thyroid and pituitary on the other, and of antagonism between these two groups. The former group is considered to be anabolic in action, storing up potential energy, and the latter catabolic in action, utilizing the energy thus stored and cooperating with the gonads in the preservation of the individual and the continuity of the species. This conception is offered to explain the part the endocrines play in instinctive behavior and emotional life as well as in the determination of growth and evolution. Using this idea as a working hypothesis, an attempt is made to correlate various clinical syndromes with known and unknown physiologic action of the different endocrine glands according to evidence of existing decreased or increased function of the gland or glands involved. In discussing this phase of the subject numerous experimental and clinical observations are presented to show that many of the diseases of the autonomic nervous system and endocrine glands either interfere with the mechanism of defense or the providing of the organism with sustenance, so that the individual with an abnormal endocrine balance carries on his struggle for existence with a handicap.

In considering a rational plan for endocrine therapy the fact is pointed out that the gland in question must have an internal secretion, that the active principle of secretion can be extracted, and that a method of administration of this extract must be found which will admit of its utilization by the body. The concluding chapter deals with a discussion of the future of endocrinology. A prophecy is made that it will play an important part in the study of psychoneuroses and in the rational determination of vocation.

This book presents a brief account of the essential known facts concerning the endocrine system and also a considerable amount of speculation on various phases of the subject. The author at times is inclined to base his assumptions and opinions on clinical observations which are not checked by proper controls. In discussing adiposis dolorosa he states that he has seen decided benefit from the use of thyroid extract, together with injections of pituitrin, especially when combined with a suitable diet for obesity. This is an example of empirical pluriglandular therapy which gives no reliable information as to the cause of obesity or its successful treatment.

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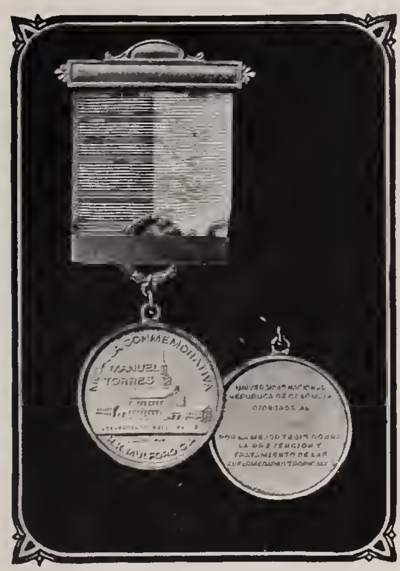

FIRST AWARD OF MANUEL TORRES PRIZE

Announcement has just reached this country, from the Faculty of Medicine of the University of Bogota, through the Colombian Legation, Washington, D. C., to the effect that the Manuel Torres prize, for 1927, was won by Mr. Francisco Luis Cadavid, in recognition of his thesis entitled "El absceso ambiano del higado y su tratamiento actual."

The Manuel Torres prize consists of a gold medal, offered each year to the medical students of the graduating class of the University of Bogota, for the best original thesis approved by the Faculty on a subject connected with the prevention and treatment of tropical diseases. This prize is offered through the generosity of Mr. Milton Campbell, President of H. K. Mulford Company, Philadelphia, U. S. A., in commemoration of the life and deeds of Don Manuel Torres, who will be remembered as the first minister of the Republic of Colombia, and, incidently, the first Latin American Diplomatic Representative in the United States of America.

Mr. Cadavid is to be congratulated upon the excellent work he has done in preparing this thesis, and the Mulford Company are to be commended for offering this annual prize, which cannot do other than stimulate an interest among the medical profession of Colombia in doing original thinking in connection with combatting tropical diseases.

Pluriglandular therapy is generally irrationally applied without reference to potency, dosage, or method of administration. While many important discoveries have been made regarding the endocrine glands, knowledge is still limited to fragmentary facts that require further study before any definite idea can be formed of the manner in which the different functions of the body are regulated by these glandular secretions. The value of insulin, thyroid and parathyroid extracts in replacing deficient secretions from their respective glands has been established, but the value of the other glandular secretions, including ovarian extract, adrenalin, and pituitrin for this purpose, is questionable. However, adrenalin and pituitrin are useful drugs when used for their local vasoconstrictor or stimulating effect on smooth muscle. With the exceptions mentioned above, results have not justified the widespread use of these glandular preparations. MAYFIELD.

HANDBOOK FOR THE MEDICAL SOLDIER of the Regular Army, National Guard, Organized Reserves, and Enlisted Reserve Corps of the Army of the United States and others interested in National Medico-Military Preparedness. By Arnold Dwight Tuttle, Major, Medical Corps, U. S. Army. 672 pp. $5.00. William Wood and Company, New York, 19

To one who has lived and knows the needs and deserts of the enlisted men and particularly the medical soldier, this book is most comprehensive and illuminating, yet succinct, and up to date, presenting the basic knowledge desired by the enlisted men. It is a concise, practical and systematic presentation of only such themes as are essential to the majority, free from the technical specialties, yet broad and comprehensive enough to serve as a foundation to which further knowledge may be added by careful observation of what this preparation for war involves. If all men were well informed on the history and general organization and functions of their branch, our transition from a peace to a war status would be materially simplified. This book is the best of its kind in print today. Its use is heartily recommended by all medical soldiers and by all others interested in medicomilitary preparedness. GARDNER.

TROUBLES WE DON'T TALK ABOUT. By J. F. Montague, M.D., F.A.C.S. Lecturer on Rectal Pathology, University and Bellevue Hospital Medical College. Illustrated. 248 pp. $2.00. J. B. Lippincott Company, Philadelphia and London. 1927.

The author states such a book as this has never before been published in the interest of the public health. It is intended for the consumption of laymen. It deals with many common ailments of the rectum and anus. He laments the shameful neglect of rectal diseases on the part of both patient and physician, who are too modest to discuss and treat such disorders. A chapter is devoted to prove that an examination properly done should cause neither pain nor embarrassment. He offers facts about hemorrhoids and emphasizes how commonly bleeding may indicate cancer rather than piles. There are other sensible chapters on constipation and its relief by various drugs and physical methods of treatment. He pays his attention to unnecessary operations and those doctors who are known to be "quick on the knife." Since there is no field so fertile for quackery as diseases of the rectum, the patient is frequently advised to consult a trustworthy physician for these conditions.

THE MEDICAL CLINICS OF NORTH AMERICA (Issued Serially, one number every other month.) Volume XI, No. 4. Brooklyn Number. Octavo of 277 pages with 53 illustrations. Per Clinic year, July 1927 to May 1928. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume discusses many medical problems of interest which are well worth reading by every practitioner, only a few of which can be mentioned. Presenting problems in diagnosis, Moses discusses an unusual example of Raynaud's disease with central nervous system involvement. It resulted in areas of gangrene on legs, arms, trunk and face. This condition is discussed in detail as to etiology and pathology. Smith reports sixteen cases of intracranial hemorrhage of newborn, three of which were normal spontaneous vertex deliveries, all of the others having some abnormal phases. Five died within two days after delivery. Treatment comprises efforts to control hemorrhage, relieve pressure and supply fluid, the details of which are presented. By the discussion of a series of cases, Howard illustrates the possibility of serious disease in early life with complete functional restoration. A man of eighteen years for six years had albuminuria and anasarca from acute nephritis, which has been followed by nine years of apparently good health. A boy of three and a half years developed streptococcus infection in the lymph-glands in the neck, followed by splenomegaly and diverticulitis, this condition persisting for six years. Now, at the age of sixteen, he is a vigorous, muscular youth. A man of sixty-three developed diabetes followed by pernicious anemia, when his red cells dropped to about a half million and hemoglobin to twenty per cent. This condition was accompanied by cholelithiasis. Now six years later, the red cells are nearly five million, hemoglobin 98 per cent, and he feels quite normal. Banowitch and Ira report five cases of embolism and thrombosis of the abdominal aorta, with autopsy findings, and a discussion of the clinical picture of this condition. There are many other equally interesting reports.

SCOLIOSIS. Frank R. Ober and Ralph K. Ghormley, Boston (*Journal A. M. A.*, Feb. 4, 1928) present in a general way a brief summary of scoliosis; its etiology and diagnosis is considered briefly, and treatment is discussed from the nonoperative and operative aspects. Illustrative cases are reported. The authors assert that functional and mild structural curves can be managed by simple corrective measures. Moderate and severe curves should be treated by corrective exercises and corrective apparatus. Operative measures are to be recommended in adult patients whose spines are not already fixed by nature, and who are doomed to a jacket life.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

THE ANATOMY OF GROWTH *

T. WINGATE TODD, F.R.C.S. (Eng.)
CLEVELAND, OHIO

Professor of Anatomy.
Director of the Hamann Museum
Western Reserve University

THE ANALYSIS OF GROWTH

It is a common observation that a child grows, but when we use the expression we mean really two things. We intend to indicate that he has increased his dimensions but, since with the change of dimensions there is normally a modification of proportions, we mean also to include this in our observation. And if by any chance modification of proportions has not accompanied the dimensional increase, as may and occasionally does occur, we would say, "yes, he has grown but there is something strange about it." Our attention is often only arrested by the failure of some phenomenon to which we are accustomed. And that is distinctly true of growth. It is a term which, as generally used, implies both increase in dimensions and change of proportions. The pigmies of the Congo forests have grown to be men but in dimensions they are not more than ten year old boys. They are not misshapen or men with the proportions of boys. The normal increase in dimensions, characteristic of the majority of mankind, has failed but the features have continued to modify so that the adult proportions are attained. This, then, is our first lesson in dissociation of growth.

While increase in dimensions is lacking after adult age is attained, the change in proportions continues throughout life; the individual has grown old we would say. My slide of the Sudanese women from Dafur illustrates this excellently. Here are the characteristic proportions at twenty, forty, sixty and eighty years. By change of proportion we can estimate age just as well as by the increase in dimension. This is the central theme of my presentation. It is a qualitative change and yet is as definite, though more difficult of measurement, as the quantitative dimensional change. Now let us clinch this argument by certain cases of dissociation of growth.

DISSOCIATION OF GROWTH

Here is the skull of a lad of eighteen years, Ludwig by name, arranged with the skull of a normal lad of eighteen on one side and that of a child one year old on the other. Ludwig has grown so that his skull cap will fit easily like a hat over the other eighteen-year-old's head. Dimensionally he has nothing lacking. But note the disproportionately small face, the undeveloped jaws, the rounded forehead, the small cheek bones. These are matched by the one-year-old. In other words, Ludwig has not matured; his proportions have not kept pace with his dimensions. When we look at his side face we see even more clearly the baby

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* Read before the Sixth Annual Meeting of Pacific Northwest Medical Association, Boise, Ida., June 27-29, 1927.

jaws, the undeveloped zygoma and mastoid and the lack of muscular ridges on the skull. Something has occurred to inhibit the differentiation of maturation of Ludwig's skull, while permitting to the full his increase in dimensions. This is the exact antithesis of the pigmies mentioned above.

John Hahn was a lunatic thirty-one years old, whose mandible is much too large for his head. At a first glance one would say there is nothing else wrong with his skull. But his cranial capacity is only 870 c.c., little more than half the normal equipment for an adult man. The mandible is not really abnormally large as in acromegaly; it is of the usual dimensions. The upper jaw and palate are also of practically normal size. Yet upper and lower teeth do not meet. The brain case, never having grown, has held back the face and upper jaw, whereas the mandible, which only articulates with the skull and is not hafted thereto as the face is, has grown forward normally. This case is quite unlike Ludwig because it is now dimension, not proportion, which is at fault. The case is also more complex since inhibition of dimensional increase is restricted to the brain case. The face is unaffected but, since it is anchored to the brain case, has become involved in the confusion.

Dimensions are a matter of heredity on the one hand and nurture on the other. Little Rose brings a message from her mother asking if I will tell her what she can take to make her grow big. I can give no hope of this for Rose's mother and father are both made on small lines and Rose will always be small and slenderly built. She will always be under weight for her age but may nevertheless be strong. Again, there is no doubt that children today are bigger and heavier on the average than they ever were. Karl Pearson and Sir Arthur Keith have demonstrated this for the young people of England and Horace Gray has shown it for Americans. This is quite natural for we are better fed and more scientifically nourished today than ever before. Consequently, height and weight tables are apt to be disappointing and we are compelled to search for some standard of growth which is independent both of heredity and nurture. Hence we are driven from the quantitative dimensional measurement to the qualitative proportional determination.

THE MEASUREMENT OF GROWTH

In thus searching for a new principle of standardizing growth we may turn to several methods. We may consider chronologic age. But this is a determinator based on the universe and has nothing to do with the individual who may develop quite aberrantly. He may fail to punch the time clock which has no immediate relation to him. We may use the physiologic method, taking vital capacity or muscular power for example. But such measurements are greatly influenced by the interest of the patient. Of late years biochemic methods have been introduced, such as the creatinine content of the urine. Actually, however, blood is the only body fluid not affected by diet, and blood chemistry means in practice hospital observation. It is not applicable as a general routine. In effect we are driven back to bodily modifications which are independent of heredity and nurture, that is to say, change of proportions.

I have now shown you how we have sought by one means and another to find a standard of measurement of bodily changes which are inseparable from age but may not progress at the same rate in all individuals. While we must measure progress, we seem to be driven back upon some anatomic indicator and that indicator appears most likely to be found in qualitative differentiation rather than in quantitative dimensions.

The next problem on hand is the search for the organ which shall most closely indicate general body growth. Scammon's survey of organ growth discloses five types after birth. These are respectively the splanchnic type which includes body weight itself, and the four special organ types of thymus, brain, uterus and adrenals. None of the four latter is satisfactory for our purpose for they are special types called forth by the characteristics of the organs mentioned, the activities of which do not follow general bodily development. Again, Scammon has shown that, when we consider relative postnatal growth, we must group skeleton, lungs and blood with the body as a whole. Of these organs the skeleton lends itself most readily for our determinations. For the period of life which we have been studying, namely that of the grade school child, roughly between five and twelve years, Stratz has demonstrated that there is, on the average, a fairly even percentage increment of growth in height, distinctive from the spurts below and above this period. If, then, we confine our attention in the preliminary stage to this period of life, we are not likely to be confused by the entry into our observations of factors called forth by special activity.

THE TIME CLOCK IN HUMAN ANATOMY

That there are special bodily characteristics demonstrable during this period is a matter of common knowledge. Hardy, in his famous novel, Tess of the Durbervilles, writes thus of his heroine at twenty years. "For all her bouncing handsome womanliness, you could sometimes see her twelfth year in her cheeks, or her ninth sparkling from her eyes; and even her fifth would flit over the curves of her mouth now and then." If such observations can be made upon so intangible a subject as expression of the face, surely we may hope to find their counterpart ascertainable from the skeleton. But of course there remains the question how closely time linked these special, though as yet unrecognized features may be.

Previous work upon the skeleton gave us courage to engage in an expensive and time-consuming investigation. We had been at work for some years upon closure of sutures and union of epiphyses. Contrary to current assumption, we have discovered a close time-relation in both these phenomena. But whereas individual differences in epiphyseal union are slight, those of suture union are so considerable that it can only be used as an average for the community.

The really active period of suture union is between twenty-five and thirty years. We have found no significant sexual or racial differences. The sutures of the cranial vault have a steady period of active closure commencing at twenty-five years, although the sagittal begins somewhat earlier, and this period terminates at thirty years, after which date closure continues very slowly or not at all, no matter at what stage it finds itself at that point of life.

The period of epiphyseal union ends just before that of suture closure begins, namely at twenty-five, with the union of the sternal epiphysis of the clavicle. Further, epiphyseal union is very closely time-linked and individual differences are few and slightly marked. An epiphysis is a cartilaginous mass which ossifies entirely or in part and fuses with the main element of the bone. We are very apt loosely to think of the ossification center itself as the epiphysis but this is incorrect. In the illustration of the humeral head at four years the bone and cartilage of the epiphysis can be readily distinguished because cartilage after death casts a roentgenographic shadow. In the long bones, where epiphyseal union is most closely time-linked, all the epiphyses except those of the humerus unite between the eighteenth and the nineteenth year. The head of the humerus does not unite till a year later and the epiphyses of the other end of this bone are already united by fifteen.

I must ask you to note particularly this heterodox discovery of the date of epiphyseal union because it is quite at variance with accepted statements which are based on altogether insufficient evidence. And I ask you to note it particularly because it was this quite unexpected discovery of a close relationship of epiphyseal closure to age that gave us the clue by which we determined to develop our research upon skeleton differentiation in the grade school child. You will observe that we are dealing here with a qualitative change and not a quantitative dimensional progress. For this elucidation of epiphyseal union we are indebted to the work of Stevenson in my laboratory. It was the first definite demonstration that the child really punches a time clock in his development.

GROWTH IN THE GRADE SCHOOL CHILD

During the past two years, supported by the Cleveland Health Council and the Board of Education, we have made repeated observations upon the roentgenographic features of the limb epiphyses of between 600 and 700 children. It will be some years before the immense mass of data thus called in to being is fully developed.

But we are already in a position to report substantial progress and can assure ourselves of a positive result. Of all the limb epiphyses those of the knee are easiest to study for they are covered by a negligible amount of soft tissues and the roentgenographic shadows are correspondingly slightly deformed. It must be noted that we lay no stress upon ossification of carpals or tarsals, a phenomenon which we do not find to be closely time-linked as is the differentiation of bony epiphyseal outline.

If I were called upon to define the sex differences between human males and females, I should not choose newborn babies as the material upon which to work. I should ask for adults because it is in the terminal stages of development that these differences appear most clearly. Similarly, if I wish to differentiate time-linked features of epiphyses, I should not choose very young bones in which the epiphyses are mostly cartilage and cast no roentgenographic shadow in the living. You see it is the terminal stages of bony differentiation of epiphyses which we utilize for our standards of development.

Confining our attention, then, to the epiphyses of femur and tibia at the knee, let us refresh our memory regarding the adult anatomic features of these parts. There is often in the adult bony tissue a line which marks the site of union of the epiphysis. This line, usually lost within six months after union, may remain even throughout life. Its presence is immaterial but on the bone sections exhibited it serves as a landmark.

In the femur the inner condyle has the greater height. The lateral margins of the condyles are squared off and there is even a concave contour in the lower part of each lateral face.

In the tibia this squaring of the epiphysis is also seen. Moreover, the epiphysis fits like a hat over the shaft, extending laterally beyond it on each side. The articular surfaces of the tuberosities are concave and between them rise, like two little minarets, the two tibial spines for attachment of the crucial ligaments.

If we examine the roentgenogram of the knee of a child of seven years, and it must be a cadaver for only in the dead does cartilage cast a shadow, we see that ossification has not yet progressed throughout the epiphyses and the bony contours are far from the appearance noted on the adult. The femoral condyles show no such difference in height; they are not squared off and there is no concavity in the lower lateral outlines. In the tibia the bony articular faces are not concave, the minarets are not formed, the epiphyseal outline is not squared off nor do its bony margins overlap the outline of the shaft.

As examples illustrative of the developmental progress at the knee, I have prepared a series of lantern slides showing typical stages of successive years from the sixth to the thirteenth. These knees have no relation to bodily size or weight, for the features I am about to demonstrate are independent of both.

At six years the bony condyles of the femur are not different in height; they are not squared and the lateral outlines are not yet developed. They do not extend back of the shaft to any extent. The lower end of the shaft shows no thick white foggy zone so characteristic of seven years. The tibial epiphysis has no double concave bony outline and the lateral margins are far within the limits of the shaft.

At seven years the femoral shaft shows the foggy zone just mentioned, due to a temporary slowing up of growth progress. The condyles begin to extend back of the shaft.

At eight years the foggy zone is almost cleared up and on the tibia the double concave articular outline begins to appear.

At nine years the internal condyle is markedly the higher.

At ten years a beak appears for the trochlear surface of the femoral epiphysis.

At eleven years the lateral outlines of both femoral and tibial epiphyses are squared.

At twelve years the lateral concavities develop in the outlines of the femoral epiphysis and the tibial epiphysis overlaps the shaft laterally on both sides.

At thirteen years the tibial spines are fully ossified.

THE PRACTICAL APPLICATION OF OUR METHOD

This last specimen is from a young giant in height and weight and yet this anomaly of heredity and nurture plays no part in the qualitative developmental progress of the epiphysis.

Let us take another example. The knee of a boy of ten years and eight months weighing 182 pounds shows exactly the same stage of progress as the knee of a normal lad of the same age.

In the knee, then, we have found a criterion for estimating stage of development in terms of years, closely time-linked and yet independent of general bodily features such as height and weight.

We are now working on other long bones and have discovered corresponding phenomena there also.

We find that, whereas boys are closely time-linked, girls are apt to vary from the features of the male stage at the same age to those of the male stage two years later.

While we are examining the children with the x-ray, we are also measuring them, weighing them and determining their muscular strength. We find that our growth curves closely parallel those of other workers and we have plotted ours against those of Baldwin's Horace Mann School series.

If we apply the information thus received to the undernourished child, we find that it is quite possible to analyze the condition of the child in age, height, weight, roentgenographic development and muscular power. By these means it can be demonstrated that there are quite different types of undernourishment; that one type affects weight, another muscular strength; that frequently the so-called undernourished child is really a human weed, whose height has mounted disproportionately to his other features. I would close by presenting, as a general object, the thesis that in attacking undernourishment we should first analyze the condition of the child and then concentrate our effort upon that phase only in which the child is deficient, not attempting in the weed type to bring weight up to height but resting satisfied, if the weight is raised to the local average for age and roentgenographic development.

SUMMARY

1. Growth consists of two phases: increase in dimensions, quantitative; change in proportions, qualitative.
2. Each of these phases may be influenced apart from the other.
3. In the search for a suitable time-linked standard of measurement, qualitative differentiation of limb epiphyses seems the most practical.
4. Definite time-linked stages of development can be identified in the epiphyses at the knee and other sites in the grade school child.
5. Boys are more closely time-linked than girls.
6. The criteria used are independent of factors induced by heredity and nurture.
7. A method of analysis of undernourished children can be built up by the methods outlined in this paper.

ENURESIS. Joseph K. Calvin, Chicago (*Journal A.M.A.* March 17, 1928), discusses the immediate causes of enuresis, which are either organic or physical disturbances or bad habit formation due either to lack of proper training or to an oversensitive nervous system (neurotic or emotionally unstable child) or both. A complete physical and laboratory examination should be made to rule out physical causes or to correct them before starting to treat the condition as an undesirable habit. As soon as the rhythm and habit of urination are fairly well established, the child should be taught to feel that it is distinctly his task and responsibility to keep dry. The chief causes of failure to train the child properly and consequently the psychologic causes of bed-wetting are: I. Postponing the training beyond the natural age. 2. Arousing fear concerning the ability to control the bladder. 3. Arousing a feeling of antagonism as a result of the spirit of the training. 4. Emotional scenes on the part of the mother or nurse concerning the use of the toilet, such as showing great concern over accidents, weeping, or petting or coaxing excessively. 5. Excessive "babying" by overaffection. 6. Masturbation, which may be associated with enuresis, as both conditions are frequently present in the emotionally unstable (nervous) child. 7. Emphasizing organic ailments to the children or in their presence without sufficient basis for such statements. The active treatment of established enuresis can be easily and successfully carried out if certain fundamental principles are adhered to. Most cases can be cured within a few weeks' time, but the utmost cooperation of the parents is essential.

NONTRAUMATIC LESIONS OF THE DIAPHRAGM IN INFANCY AND CHILDHOOD*

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On account of its anatomic position, physical examination of the diaphragm both in health and in disease is a most difficult problem. Previous to the discovery of the clinical uses of the x-ray, diagnoses of its pathologic conditions were with few exceptions made at operation or postmortem. Now, with modern roentgenologic methods, physicians are enabled to determine accurately the existence and nature of diaphragmatic pathology. The result is apparent in the medical literature of the past twenty years which contains hundreds of case reports of hernias, congenital defects and other lesions peculiar to the diaphragm. I shall not attempt here to cover the entire field of pathology of the diaphragm, but to present reports of three hospital cases selected from the pediatric service of Dr. Joseph Brennemann, together with comments on the problems in diagnosis, differential diagnosis and treatment which arose during the time that the patients were under observation.

CONGENITAL DEFICIENCY OF THE DIAPHRAGM

For a long period clinicians applied the term "hernia" indiscriminately to any defect in the diaphragm, through which the abdominal viscera had eventrated into the thorax. Now, two types of lesions are recognized. One of these resembles the common hernias of other regions, in that the abdominal organs, although escaping into the chest, remain separated from the thoracic cavity by a hernial sac composed of thinned-out diaphragm or its pleural or peritoneal covering. Such nontraumatic lesions, which are now called "true hernias," are practically unknown as congenital anomalies. In the acquired form they are found at points of weakness in the structure of the diaphragm, notably at the esophageal opening and at the foramina of Morgagni near the xyphoid process. True diaphragmatic hernias are practically limited to adult life. Healy[1] has reported a case in a boy of five years who had been subject to regurgitation since the age of six months.

There are, however, certain congenital symptom-producing defects of the diaphragm, which are much more frequently encountered in early life than are true diaphragmatic hernias. These are termed "false hernias." They are characterized by complete absence of a hernial sac. When abdominal viscera escape through such openings, they are not separated from the thoracic organs by a hernial membrane. In place of the term "false hernia" Latta suggests "congenital deficiency of the diaphragm" as being more accurately descriptive of these anomalies.

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* From the Children's Memorial Hospital, Chicago, Ill. Read before North Pacific Pediatric Society, Tacoma, Wash., Aug. 30, 1927.

The origin of congenital deficiencies is readily understood, when one considers the embryology of the diaphragm. In the early fetus the future pericardial and abdominal cavities become separated ventrally by a shelf-like structure, called the septum transversum, whose free edge faces toward the spine. Dorsally, the pleural cavities still communicate with the abdomen through two pleuroperitoneal canals. These openings are closed at the fourth week by the pleuroperitoneal membrane which fuses ventrally with the free edge of the septum transversum to complete the structure of the diaphragm.

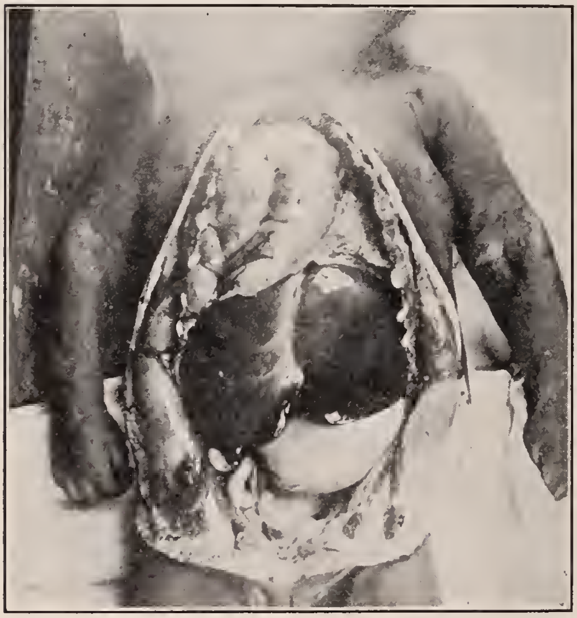

Fig. 1. Congenital absence of right diaphragm. Necropsy specimen, showing portions of colon and small intestine occupying right thoracic cavity.

Congenital defects, due to failure of development or fusion of the component parts of the diaphragm, vary greatly in size. Some are too small to permit escape of abdominal viscera. Again, the entire diaphragm, or a half or a fourth of it may be lacking. Naturally the larger congenital deficiencies, with massive invasion of the chest by abdominal viscera, are incompatible with life. The infants, if born alive, succumb shortly after delivery. The accompanying photograph illustrates the necropsy findings in a newborn having congenital absence of the right side of the diaphragm with eventration of portions of the colon and small intestine into the right thoracic cavity (fig. 1.)

The left leaf of the diaphragm is much more frequently involved than the right. Eppinger[2] in 1912, in a review of the reports of six hundred thirty-five patients having all types of diaphragmatic hernias, found the left side involved in five hundred eighty cases. Although the liver may aid in protecting the right leaf of the diaphragm, there would appear to be an actual greater tendency toward failure of development on the left. In support of this view is the fact that the lung on the side of the diaphragmatic defect is rudimentary in a large proportion of cases. Deficiencies are much more likely to be located posteriorly, at the former sites of the pleuroperitoneal canals, than in the central or anterior portions of the diaphragm.

In the case of small or medium sized defects there may be no sign of trouble at birth. The infant often progresses normally until, after a period of weeks to years, a portion of the gastrointestinal tract becomes partially or completely strangulated in the opening, or abdominal viscera invade the thoracic cavity in sufficient amounts to interfere with cardiac and respiratory action.

Partial or intermittent gastric and intestinal obstruction, characterized by distress at meals, attacks of vomiting, constipation, abdominal distension and visible peristalsis, has been reported to have existed in patients for years before the true diaphramatic cause was detected. In a surprisingly large percentage of patients, the stomach and intestines, or portions of them, actually occupy the pleural cavity without producing obstructive symptoms. In such cases, however, there more frequently exist symptoms referable to the region of the chest. These are due to pressure by abdominal viscera and are variable and inconstant. They are particularly apt to be aggravated by food taking. Older children often complain of thoracic distress at meals. Attacks of cyanosis and suffocation may occur with accompanying disturbance of cardiac and respiratory rhythm. In infants, the act of nursing is often noted to bring on such paroxysms.

Important signs generally can be elicited by careful percussion of the chest. When portions of the stomach have gained access to a pleural cavity, a deviation from the normal percussion note results. The degree of resonance may vary from an absolutely flat sound to a hyperresonant or tympanitic note. On auscultation the breath sounds may be found absent, suppressed, tubular or amphoric. The heart may be displaced, most commonly to the right, since the majority of defects are located on the left. Such abnormalities of percussion and auscultation may strongly suggest pneumothorax or hydropneumothorax. In order to exclude these, where the symptomatology is not clear, one should determine the effect of taking liquid food on the physical findings in the chest. Immediately or soon after ingestion of fluid one is commonly surprised, on repeating percussion and auscultation, to find a totally changed picture. In addition, there may now be heard those gurgling and tinkling sounds which can normally be detected over the abdomen, and which are due to gastrointestinal peristalsis. Variability of chest findings in relation to food taking should always suggest the possibility of diaphragmatic defect.

The x-ray, without doubt, has been the most important single factor in promoting study of the diaphragm and placing diagnosis of its pathologic conditions on an accurate basis. In all cases, where interference with the mechanical function of the gastrointestinal or cardiorespiratory organs is suspected, there should be early resort to the radiogram. In addition, barium should be introduced at separate examinations into the stomach and colon and the positions of these organs noted under the fluoroscope. A series of examinations may be necessary as the opaque mixture often shows a delay in reaching those portions of the stomach or bowel which have passed through the defect in the diaphragm.

The treatment of congenital openings in the diaphragm which are producing serious symptoms is essentially surgical. One may temporize with a trial of the effect of posture, or of frequent, small feedings, but if no benefit ensues from these measures, it is unwise to delay longer an attempt at surgical repair. The condition is in many cases incompatible with proper nutrition and development. At any time sudden death can occur from excessive pressure of adbominal viscera on the heart and lungs. Again, acute intestinal obstruction may without warning complicate the situation and force surgical interference under an additional hazard.

Very few reports of operations for the closure of defeciencies of the diaphragm in early life are to be found in medical literature. Behrend[3] in 1924 reported the successful repair of a defect in a seven year old boy. The larger defects are beyond the possibility of closure but infants having these rarely survive their birth. In the past the operative mortality has been high but one must remember that surgical measures have usually been undertaken in the presence of acute intestinal obstruction or serious cardiorespiratory embarrassment.

ILLUSTRATIVE CASE

E. C., infant girl, aged six months, was admitted to the hospital Feb. 5, 1925. The mother stated that the baby was born by a normal labor and weighed six pounds. It progressed satisfactorily on breast feeding until the end of the fourth month, when its weight reached fourteen pounds. It then began to nurse poorly and became badly constipated. Supplemental feedings of cow's milk were instituted but failed to effect a further gain. Three weeks previous to entrance to the hospital the baby contracted a cold, breathed heavily, and frequently coughed in a prolonged, nonspasmodic manner. Vomiting was absent. The weight declined rapidly to nine pounds.

Upon examination the pale and undernourished infant was found to be breathing with increased frequency and a short, expiratory grunt. Percussion revealed a dull note in the left chest, both front and back. Posteriorly the breath sounds were diminished. In a small area beneath the left clavicle, modified tubular breathing with occasional fine crepitant rales could be heard. The right border of the heart was displaced 2.5 cm. to the right of the right sternal margin. The left heart border dullness merged with the dull note over the left chest. The maximal apical heart tones were located immediately to the right of and above the xyphoid process. The abdomen was scaphoid and contained no palpable masses. The temperature, pulse and routine laboratory findings in blood and urine were negative.

On suspicion of an exudate filling the left pleural cavity, a roentgenogram was made. In this a shadow was seen to occupy almost completely the left side of the chest. The lower half of the radiopacity was quite homogeneous. In the upper half, however, the appearance was that of multilocular, air containing spaces. The heart showed a moderate dextrocardia. After making a tentative diagnosis of mediastinal tumor or an inflammatory exudate with multiple spaces due to adhesions, an aspirating needle was cautiously inserted at the lower angle of the left scapula. A few drops of an opalescent gray fluid, resembling chyle, were aspirated. Upon microscopic examination this fluid was found to contain many fat globules and a few lymphocytes.

Percussion of the chest on repeated examination established the fact that the note varied considerably. At times it was quite tympanitic, and again decidedly flat. Tinkling sounds could be detected after food taking. Upon the third day of hospitalization the infant began to have noticeable difficulty toward the end of or shortly following breast or bottle feedings. In these attacks it became restless and the pulse rate quickened. Dyspnea and cyanosis accompanied these paroxysms and upon several occasions reached alarming severity. Vomiting at no time occurred and the bowels moved normally. The displacement of the heart to the right increased. A second radiogram (fig. 2) revealed the left thoracic region to be entirely filled by a shadow composed of multiple spaces or loculi. The heart and mediastinum were displaced far into the right pleural cavity. The diaphragmatic line on the left was not clear and a vertical area of decreased radiopacity appeared to pass through it. The normal shadows of intestinal loops were missing from the abdomen.

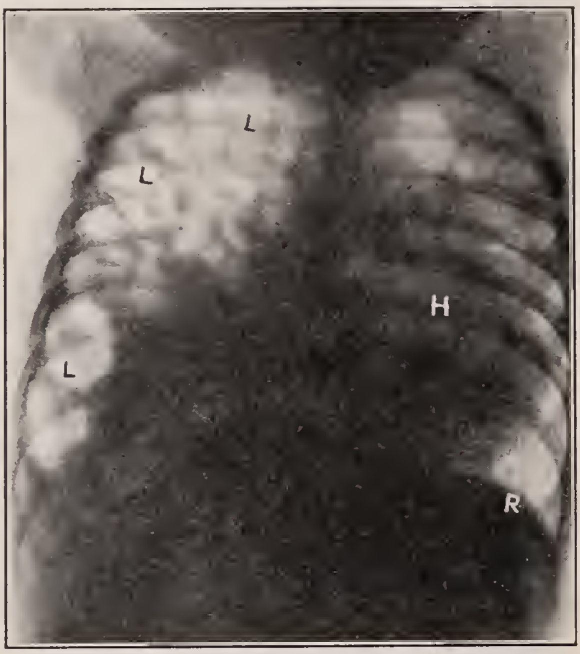

Fig. 2. Congenital deficiency of diaphragm: H, dextrocardia; L, loops of intestine in left thorax; R, right diaphragm. Note absence of outline of left diaphragm.

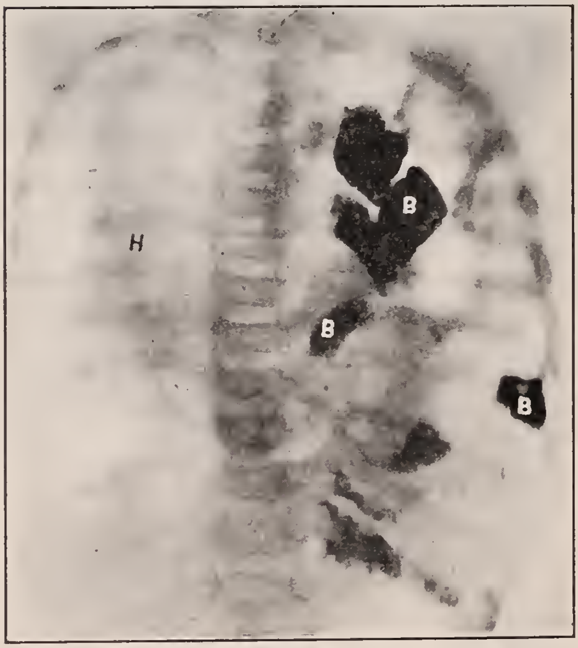

Fig. 3. Congenital deficiency of diaphragm following opaque meal: B, barium occupying intestine in left thorax; H, dextrocardia.

A congenital deficiency of the left leaf of the diaphragm was the explanation offered by the consulting surgeon, Dr. A. H. Montgomery, for these peculiar roentgenologic findings. This diagnosis was confirmed by fluoroscopic examination. A barium-milk mixture passed without delay into the stomach which lay in its normal location. One hour later barium shadows were found scattered throughout the left pleural cavity, obviously in coils of intestine (fig. 3).

Frequent small feedings and various changes in position did not relieve the dyspnea and cyanosis. These symptoms were most severe after nursing. The displacement of the heart toward the right was increasing. Because it was evident that the infant's condition would soon become incompatible with life, surgical intervention was decided upon.

Under ether anesthesia the abdomen was explored through an incision in the left rectus muscle. The stomach, liver and spleen were found in their normal positions. The only portions of the intestine remaining below the diaphragm were the duodenum (with the head of the pancreas), the rectum, sigmoid and lower portion of the descending colon. That the remainder of the bowel lay in the left pleural cavity was evidenced by the discovery of entering and returning intestinal segments snugly filling a defect in the central region of the left leaf of the diaphragm. The intestine, with its elongated mesentery and omentum, was reduced by traction into the abdomen. Considerable difficulty was encountered, due to the negative intrathoracic pressure. The diaphragmatic defect was closed by interrupted catgut sutures. The infant's condition at the end of the operation was poor. Death occurred nine hours later from postoperative shock.

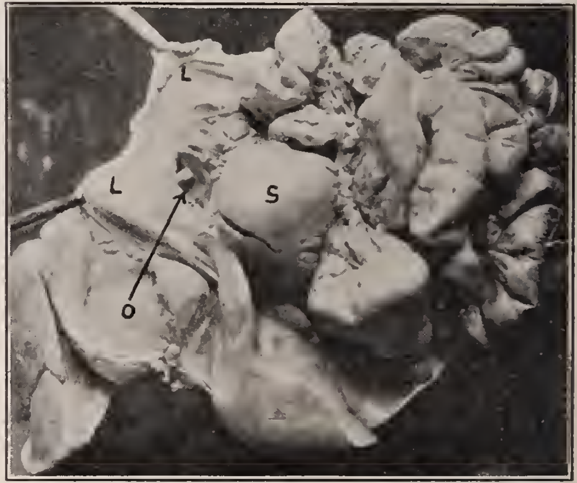

Fig. 4. Congenital deficiency of diaphragm. Autopsy specimen: L, inferior surface of left diaphragm; O, congenital defect; S, spleen.

Necropsy was limited to an abdominal incision. Consequently the exact postoperative positions of the heart and mediastinum could not be determined. There were a few scattered subserous hemorrhages on the intestine, due without doubt to the unavoidable injury at the time of reduction of this organ through the opening in the diaphragm. The pedicle of the spleen, together with the tail of the pancreas, lay in the surgically closed diaphragmatic defect. The spleen was found in the left thoracic cavity into which it had been inadvertently sucked during the difficult operative manipulations. The deficiency (fig. 4) was smooth edged, slit-like, and measured approximately 4 cm. in length. Its location was the central segment of the left half of the diaphragm. The left lung was half the normal size and lay close to the mediastinum. Crepitus could not be obtained. In a microscopic section only an occasional air-containing alveolus was to be seen. The right lung, the heart and the mediastinum appeared grossly to be normal.

COMMENT

The onset of symptoms in this patient at the end of the fourth month of life would indicate that previous to this time the intestine was either in its normal abdominal location, or had not yet entered the thorax in sufficient amount to cause pressure symptoms there. It was a surprise to find at operation that the intestinal loops filled the diaphragmatic defect so snugly, since vomiting and other signs of intestinal obstruction had never occurred. The symptomatology was entirely the result of the pressure upon the heart, lungs and mediastinum, which interfered with their functions and with the proper ingestion of food.

The central postion of the opening in the left dome of the diaphragm was rather unusual, since the majority of these anomalies are situated dorsally. The left lung was small and, although it was found microscopically to contain a few alveoli, I believe that it was undeveloped rather than atelectatic from continued external pressure. The observations of others would support this view.

The difficulties encountered during operation and the fatal outcome lead one to a serious consideration of surgical technic in operations upon the diaphragm. Surgeons usually employ the abdominal approach, partly because they are more familiar with this region, but principally on account of the fact that the majority of patients are operated upon for a complicating intestinal obstruction. French and Scandinavian surgeons and those employed in military service are said to prefer the thoracic route because the diaphragm is more accessible through this approach. Others advise in certain cases a combined operation. Richter[4] makes a long intercostal incision in the sixth or seventh interspace. In our patient the defect proved to be very inaccessible to manipulation from the abdominal side. The negative intrathoracic pressure rendered exceedingly difficult the reduction by traction of the eventrated viscera. In addition, the spleen was inadvertently sucked into the opening in the diaphagm. The thoracic route obviates such difficulties. The objection that pneumothorax is produced carries no weight, since air also enters the chest through the diaphragmatic opening during the course of an abdominal operation. A transthoracic operation in our patient, combined with local anesthesia during at least the beginning stages, might possibly have spared the infant considerable surgical shock.

ELEVATION OF THE DIAPHRAGM

In former years it was quite impossible positively to diagnose this lesion of the diaphragm except at operation or autopsy. By the use of the x-ray its incidence has been shown to be second only to diaphragmatic hernias and deficiencies. Bayne-Jones[5] in 1916 tabulated forty-five reported cases. Korns defines it as a "high position of one-half the phrenic leaf, not from displacement but from acquired atrophy of the muscle fibers." Synonyms are eventration, relaxation and muscular insufficiency.

The etiology of elevation of the diaphragm is at present a much disputed question. Those who hold that it is essentially congenital offer the following proofs for their contention: (1) It is occasionally encountered in fetuses and young infants. (2) The left side is more frequently affected (fifty-six out of sixty-five cases, according to Korns). The greater liability of the left side of the chest organs to developmental anomalies is generally recognized. (3) A rudimentary condition of the lung on the side of the elevated diaphragm and other associated congenital defects have frequently been reported. On the other hand, many cases have been observed where symptoms did not appear until late childhood or adult life. It has been contended that these are acquired cases. Even here one would have to admit the possibility of a congenital weakness of the musculature of one-half of the diaphragm. The Italians have noted elevation of the diaphragm to follow recovery from acute infections of various kinds and believe that it is associated with phrenic nerve paralysis. It would seem improbable, however, that the left phrenic nerve would be more frequently involved than the right. Behrenroth observed a postinfluenzal case with recovery in four weeks.

Pathologic examinations of elevated diaphragms show them to be dilated, thin and translucent to light. The muscle fibers are either absent or they are scant and irregularly distributed. Fatty degeneration of the remaining muscle has been described. In examinations of the phrenic nerves in seven specimens, Neumann[6] found decided pathologic changes in only four.

The condition is frequently quite devoid of symptoms, being accidentally discovered during the course of an x-ray examination. In other cases, however, the mobile abdominal viscera, particularly the stomach and intestine, follow the elevated diaphragm and thus come to occupy an intrathoracic position. Although they are separated from the chest viscera by a thinned-out diaphragm, they may encroach upon these sufficiently to produce symptoms, the most common of which are disturbance of heart action and respiratory rhythm. The heart may be displaced to the opposite side. Although gastric distress is a not uncommon symptom, intestinal obstruction rarely if ever occurs. It is impossible by physical examination absolutely to differentiate elevation from hernias and defects of the diaphragm for the reason that the physical findings in these conditions are often quite identical. The x-ray diagnosis will be discussed below.

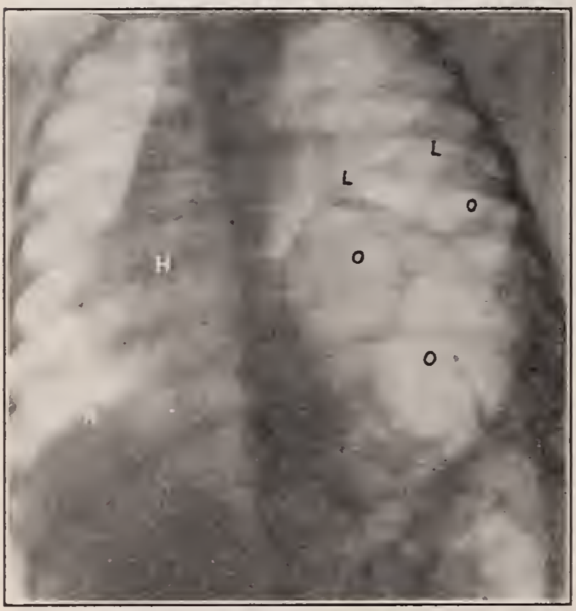

Fig. 5. L, elevation of left diaphragm; R, right diaphragm in normal position; H, dextrocardia; O, outlines of stomach and intestine.

Diaphragmatic elevation, in the absence of symptoms, requires no treatment, because it is unlikely to be complicated by grave obstructive or pressure symptoms. Even for those patients who exhibit considerable distress most surgeons have held that there is no means of surgical aid. The only operative report which I have been able to find is that of Lerche[7] who claims to have relieved the symptoms in a woman patient by sewing a fold or plait into the elevated side of the diaphragm.

ILLUSTRATIVE CASE

E. N., infant boy, aged eight months, was admitted May 2, 1922. Birth had been prolonged and difficult. He developed normally, however, and seemed in a perfect state of health until five days previously, when he displayed restlessness, cough and diarrhea. The appetite failed and he seemed at times to be sleepy and apathetic.

The infant on examination was found to be acutely ill, with fever and rapid respiration. Impaired resonance and bronchovesicular breathing could be detected posteriorly over the right lung. A few fine crepitant rales were heard over the right lower lobe behind, together with coarse rales in the region of the larger bronchi anteriorly. Percussion of the left side of the chest from behind gave a tympanitic note. The next day there were signs of consolidated areas on both sides posteriorly. During inspiration slight retraction of the epigastrium and substernal notch could be detected. The heart was displaced to the right. The clinical diagnosis was recorded as bronchopneumonia. Recovery from this was rapid, the patient being discharged at the end of nine days.

I did not personally observe this patient, but I examined a radiogram of his chest, made at the time of his convalescence from pneumonia (fig. 5). The left leaf of the diaphragm was observed to be intact, but it reached a considerably higher level than did the right, extending to the third rib. Immediately beneath it lay the cardiac portion of the stomach and loops of intestine filled with gas. Another x-ray plate, made after administration of a barium enema, disclosed the fact that the splenic flexure of the colon occupied a high position immediately beneath the outline of the left leaf of the diaphragm (fig. 6).

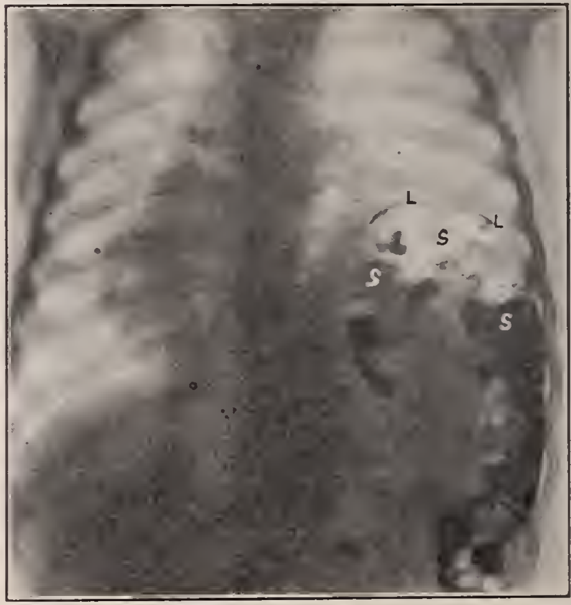

Fig. 6. Elevation of diaphragm. Appearance following barium enema: L, left diaphragm; S, splenic flexure of colon.

COMMENT

This infant was apparently free from symptoms referable to the diaphragm. I believe that the unilateral elevation was present at birth. At least there must have existed a congenital weakness of the left leaf of the diaphragm.

Another physician, observing the patient shortly after the first investigation, made a diagnosis of diaphragmatic hernia. This is not surprising, since as was stated before, there may be close resemblance of the physical findings in elevation with those in deficiencies and hernias. To differentiate these the x-ray must be employed in conjunction with administration of barium. In elevation, the bow line shadow of one side of the diaphragm is intact, although occupying a high level (often to the third or even the second rib). It completely separates the abdominal viscera from the thoracic cavity. Hernias and defects usually reveal a diaphragmatic outline which is incomplete or lacking. Some of the abdominal organs will in most of these cases be observed to lie above the incomplete diaphragm shadow or its estimated approximate level.

DIAPHRAGMATIC GROOVES OF THE LIVER

Groove formation on the diaphragmatic surface of the liver has been studied chiefly by European pathologists as a postmortem curiosity. Chiari[8] in 1899 wrote an exhaustive monograph on the subject. Aside from the shallow depressions, due to pressure by the ribs as the result of tight corsets, he described the occurrence of single or multiple, nearly sagitally placed deep grooves on the superior surface of the liver. These were nearly always located on the right lobe. It appeared for the main part to be a condition of adult life. A history of difficult respiration and chronic cough was in many instances obtained. Deformity of the chest was a frequently associated finding. Chiari and several of his contemporaries did note the condition in a few instances in fetuses and young children. A part of these had, in additionn, some abnormality of thoracic development. Chiari, however, held that diaphragmatic grooves of the liver were congenital in only a small percentage of cases.

Of the several theories as to etiology, that of long continued compression of the liver against the diaphragm as the result of difficult respiration, deformity of the thorax, or a combination of these, has been the most generally accepted one. In support of this explanation pathologists have pointed to thickening of the peritoneum and atrophy of the liver parenchyma in the vicinity of the grooves. The importance of the diaphragmatic tissue itself as a causative or a contributory factor in the production of liver grooves has been widely disputed. Certain investigators have described the presence of atrophic or hypertrophic bands of muscle in the diaphragm at the points of contact with the depressions in the liver, which they believe were responsible for the production of these. Others have denied the existence or importance of such structural relationships.

It is worthy of note that I have been unable to find a report of the clinical demonstration of diaphragmatic grooves of the liver by x-ray methods. The textbooks of roentgenology at my disposal make no mention of them. As far as I can learn, no monographs on diaphragmatic liver grooves have been published which have treated the x-ray aspects of this subject.

ILLUSTRATIVE CASE

A. D., girl, aged two years, was brought to the hospital April 16, 1925, by a social service worker, who gave a history that the child had been ill ten days. Onset was marked by difficult breathing and high fever. Dyspnea was worse at night and was partially relieved by the sitting position. The birth and family history were negative. During the first year the legs, although not paralyzed, did not develop as much as did the trunk and upper limbs. At six months, following a fall, the legs swelled within twenty-four hours and remained swollen one month. Loss of appetite and weight took place at this time. At seven months the legs could not be voluntarily flexed at the knees, but internal and external rotation of the hips was possible.

Examination disclosed a somewhat undernourished and apathetic child. The chest was symmetrically barrel-shaped, with marked prominence of the sternum. Respiration appeared to be mainly thoracic in type. Upon the day of admission there were signs in the chest suggestive of consolidation but on the following day these had disappeared. An x-ray plate showed peribronchial thickening. At this time the diaphragm outlines appeared to be normal.

The child had a partial flaccid paralysis of the legs and, in addition, knock knees and club feet. There was a tendency for the knees to assume a hyperextended position.

Temperature during the first week of hospitalization ranged from 100° to 102.5° F., after which there was an afebrile period. Ten days after admission the respiration had become almost entirely intercostal in type. A weak, whining cry and a cough that was productive of considerable mucus suggested the onset of respiratory paralysis. At each inspiration the flaccid abdominal wall retracted. The abdominal muscles were weaker on the right side. Since there was evidence that the muscular weakness was ascending, it was suspected that the diaphragm might now be involved. A fluoroscopic examination on May 6 revealed, in place of the normal curved shadow of the right leaf of the diaphragm, two slightly overlapping, dome-shaped lines, moving synchronously with each other and with respiration. The upper shadow resembled the normal diaphragmatic shadow except that its movement was somewhat limited. The lower shadow appeared, not in the form of the usual diaphragmatic line, but as the upper margin of a radiopaque mass which was considered to represent the liver. The upper shadow extended to a level in the chest, 5.5 cm. above the normally placed left leaf of the diaphragm. Although the elevation of the right diaphragm might be explained by the ascending muscular paralysis, we were at a loss to account for the double shadow on the right.

The child's condition remained unchanged for more than two weeks. She then developed bronchopneumonia and died June 3.

At necropsy the principal changes of interest were in the diaphragm and liver. The diaphragm reached the level of the fourth rib on the left side and the third interspace on the right. The liver, as it lay in situ, was of normal size and external appearance. When it was removed, however, the middle portion of the upper surface of the right lobe was found to contain a deep, wide groove, which extended in an anteroposterior and medial direction from a point 3 cm. behind the anterior margin to the posterior inferior edge. The walls of the groove were rounded. Its greatest depth was 4 cm. The right leaf of the diaphragm was now seen to contain a fold or ridge which exactly fitted into the liver groove just described. The diaphragm was next removed and examined more closely. The right dome was thin, white, and in places semitransparent. The lateral one-third appeared practically devoid of muscle fibers. In the fold or ridge described there was an increased amount of fibrous tissue. The left leaf of the diaphragm appeared grossly to be normal. No defects or anomalies of the abdominal organs were noted. There was a bilateral pseudolobar bronchopneumonia. Permission to examine the central nervous system was refused.

COMMENT

Whether this patient had a progressive paralysis of muscular or of spinal origin will remain undetermined, since the muscles and nerves were not minutely examined. I am inclined to classify the case as one of atypical primary muscular atrophy. The relaxed and atrophic appearance of the right leaf of the diaphragm as compared with the left suggested a mild degree of diaphragmatic elevation. The association of this with liver grooves has to my knowledge never been reported. The fold in the diaphragm fitted quite snugly into the groove in the liver and apparently had an etiologic role in its formation. The appearance of the two overlapping curved shadows under the fluoroscope was probably due to two factors: (1) the irregular shape of the diaphragm and the liver at the region of the groove and (2) some actual separation of the two structures, due to flaccidity of the diaphragm. The latter condition had presumably not developed at the time of the first x-ray examination to a degree that could be detected on the plate.

One must consider the probability of a congenital, unilateral weakness in the structure of the diaphragm in this child. However, it would appear that for the main part the groove in the liver had been slowly acquired as the result of difficult respiration, compressing the organ against a muscular membrane that was slowly undergoing degenerative changes.

Diaphragmatic grooves of the liver are but rarely encountered in infancy and childhood. Nevertheless they should be considered in differential diagnosis, whenever irregularities of the right side of the diaphragm or the liver are detected in roentgenologic examination.

SUMMARY

A fair proportion of diaphragmatic defects and hernias are curable by surgery. If these are to be recognized before disastrous complications have arisen, the physician who is responsible for the care of infants and children must familiarize himself not only with the symptomatology, but also with the modern methods of investigation of this hidden muscular organ. He will find, too, that the possession of a working knowledge of diaphragmatic pathology will serve him well, when he is confronted by puzzling symptoms in the chest and upper abdomen.

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Etiology and Results of Treatment in Angioneurotic Edema and Urticaria. The experience gained in the study and treatment of 260 cases of angioneurotic edema and urticaria is related by Frank R. Menagh, Detroit (*Journal A. M. A.*, March 3, 1928). No distinction is made between these two disorders. It is assumed that they are the same process, involving in the case of urticaria the superficial layers of the skin, and in angioneurotic edema the subcutaneous tissues. These cases have been classified into two major groups, according to etiology. In one group comprising 30 per cent of the series, in which there was entire freedom from biliary tract disorders, the etiologic factors were the absorption of food and other foreign proteins. In the second group, comprising 48.8 per cent of the series, biliary tract disease was the only etiologic factor. Observations were made relative to the absorption of bacterial proteins from the biliary tract in these cases. The etiologic factors in 11.2 per cent were biliary tract disease and the absorption of other types of foreign protein. Treatment was directed toward the biliary tract when this was involved, and toward the removal of active foreign proteins in those cases in which these proteins were responsible for the symptoms. In those cases in which results are known, 16.3 per cent were unimproved by treatment, 38.6 per cent were improved, and 45.2 per cent showed complete relief.

THYMUS DEATH IN A CHILD

SHOWING SEVERAL CONGENITAL ABNORMALITIES *

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Congenital defects of the lip and palate, mental deficiency and valvular heart lesions in infants are all comparatively common. Persistence of the thymus is not rare, and transposition of viscera is occasionally encountered. But when all of these conditions occur in one individual the case seems especially worthy of report.

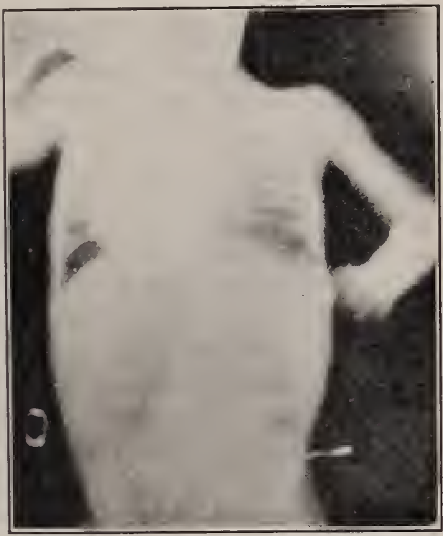

Fig. 1. Roentgenogram taken in eleventh month, showing shadow of enlarged thymus.

The patient, a full term, male infant, aged twenty-five days, was admitted to the Children's Orthopedic Hospital, Seattle, on account of malnutrition and cleft lip and palate. The history of pregnancy and labor was of doubtful accuracy, being obtained from the mother who was sixteen years of age and of subnormal mentality. Her own father was the father of the child.

Physical examination. Fairly well developed, emaciated, skin and mucous membranes pale. Complete single cleft of lip and complete cleft of palate. Chest symmetrical, expansion equal but diminished; heart dulness on right instead of left, with apex beat about 2 cm. inside of right nipple line in the fifth interspace; few coarse rales heard generally throughout chest; heart sounds fairly clear except mitral murmur suggesting an uncompensated mitral insufficiency. Abdomen; liver dulness in left hypochondrium, small left hydrocele of cord, phimosis; otherwise normal.

The child remained in the hospital eight months, during which time various formulae were used, cod liver oil was given and every other means possible used to build up his weight and resistance, but with very poor results, the total gain being less than two pounds. During this time he had several exacerbations of bronchitis, at no time being completely free from rales. The hemoglobin once reached 75 per cent but usually varied between 50 and 60 per cent. The temperature was frequently above normal, and the cardiac murmur was constantly present. At no time was he considered even a fair operative risk and he was finally discharged unimproved.

A few weeks later he was admitted to King County Hospital. Treatment was continued as before, but improvement was very slow. There were attacks of bronchitis with high temperature and the child seemed mentally retarded. At about the end of the ninth month the weight was eleven pounds fifteen ounces, hemoglobin 70 per cent and it was deemed permissible to operate.

Under ether anesthesia lead plates were applied outside the alveolar processes and held by silver wires passing across above the palatal processes. The anesthetic was well tolerated and the postoperative period was uneventful. The child gained weight slowly though consistently, but on account of the persistence of the bronchitis a chest radiograph was taken. This showed no abnormal pulmonary condition but revealed a large persistent thymus gland, overlying the hypertrophied heart, the heart being in the right chest as before stated (fig. 1).

There having been no disturbance referable to to the thymus at the time of the previous operation, it seemed reasonable to continue the surgical procedures and during the thirteenth month ether was again administered and lead plates reapplied for a short time to improve the position of the premaxilla. Anesthesia and postoperative recovery were again normal and the child continued to gain weight until in the fourteenth month it had reached fourteen pounds and fourteen ounces.

At this time ether was given for the third time and the cleft in the lip was closed, the anesthetic being as well tolerated as previously. The wound appeared to be normal but when the superficial sutures were removed on the fifth day the entire cleft reopened, there being apparently no attempt at healing. Ether was given for the fourth time and the wound immediately reunited. A course of mercury was instituted at once in spite of a negative blood Wassermann and healing took place promptly and normally.

After this the child gained rapidly in all respects except mentally and in the twenty-second month it was decided to unite the palate. Ether was given as before and the child placed in the Rose position, but before the operation could be begun respirations became shallow. The head was raised and the anesthetic discontinued, but instead of improving breathing became still more shallow in spite of artificial respiration, gradually growing weaker over a period of several minutes until it ceased entirely.

During this period of diminishing respirations all the usual methods of resuscitation and stimulation of respiration were vigorously and continuously employed, but there was not the least response as indicated by inspiratory effort. The heart continued to beat regularly for several minutes after respiration ceased and a pink color could be maintained by artificial respiration aided by oxygen. Cyanosis would gradually develop when artificial respiration was interrupted but it would be replaced by a normal color when resumed. This was continued over a period of more than thirty minutes without the appearance of the slightest evidence of respiratory effort, and attempts at resuscitation were finally discontinued.

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* Read before Meeting of North Pacific Pediatric Society, Victoria, B. C., June 21, 1926.

An autopsy was performed at once and a photograph taken, showing the relations of the thoracic and abdominal viscera (fig. 2).

The abnormal conditions noted in the autopsy report are as follows:

Head: Scar of operation on lip, complete cleft palate.

Chest: Left lung, heart and thymus occupy the anterior portion of the chest, the heart being on the right side, the right lung small and crowded into the posterior portion of the chest. Lungs attached to chest wall by many thread-like fibrous adhesions, moderate congestion of left base. Weight of left lung 112 grams, right lung 74.5 grams. Tracheal, bronchial and mediastinal glands somewhat enlarged.

Heart: Markedly hypertrophied. Apex extends nearly to the right lateral wall of the thorax, left border beyond left border of the sternum. Weight 117 grams. An interventricular foramen is present 1 cm. in diameter, 1 cm. below the base of the aortic valve and ½ cm. below the base of the pulmonic valve, the anterior border being at the thickened margin of the interventricular septum and the posterior border on the left side, being the ventricular surface and base of the mitral valve. Circumference of the aortic valve 4 cm., mitral valve 6 cm., pulmonic valve 3 cm., tricuspid valve 5 cm. The vessels leaving the heart taper rapidly, the diameter of the descending portion of the aorta being 7 mm.

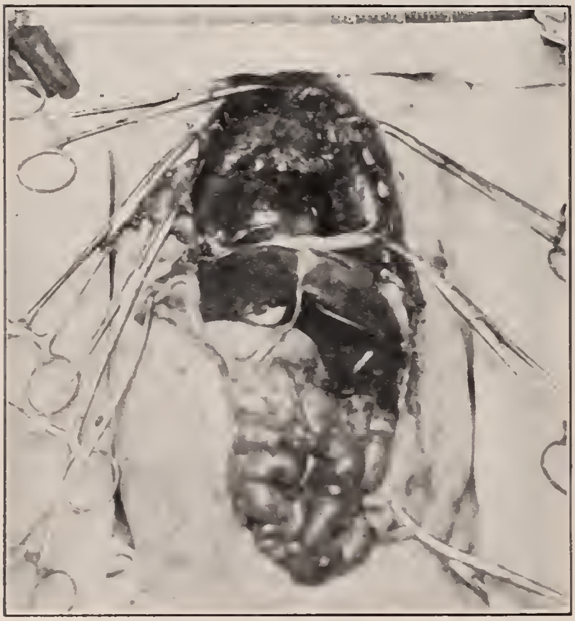

Fig. 2. The pericardium has been dissected back and the heart exposed below the thymus. Left lung is collapsed. The diaphragm has been partially dissected away for better exposure of viscera.

Thymus: Weight 45 grams, roughly triangular in shape; 8 cm. from left to right, 6 cm. from apex to base and 12 to 15 mm. in thickness. The trachea is somewhat flattened anteroposteriorly beneath it.

Abdomen: Liver on left side, weight 307 grams, fundus of gallbladder embedded in liver. Pyloric end of stomach points toward the left and lies beneath the liver. Spleen on right side, weight 50 grams. Head of pancreas toward right, weight 18 grams; cecum in left iliac fossa.

In addition to the unusual anatomic conditions which this case presents, the following facts seem of especial interest. First, although the child had a large thymus, he took four ether anesthetics without exhibiting the least abnormal reaction, and the fatal termination occurred when he was in the best physical condition of his entire life; second, death occurred without any evidence of asphyxia or mechanical obstruction of the air passages, but seemed rather to be due to a complete failure of the functions of the respiratory center.

THE THYMUS IN CHILDHOOD*

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The thymus gland is essentially a gland of childhood. For years much interest has been manifest in this structure, but in spite of this it is surprising how little is definitely known about it.

ANATOMY AND PHYSIOLOGY

The anatomy of the thymus is subject to marked variation. The average weight is usually given as 15 grams. Up to the time that respiration is established, the gland is broad, the borders extending to the mid-axillary lines. After respiration is established, the gland becomes elongated and its surfaces are molded by the organs or structures in direct contact with it. The lateral surfaces are in contact with the lungs and pleura, the anterior surface is overlapped by the lungs, and the inferior surface usually overlaps the right ventricle. The thickest portion is just above the base of the heart.

The general opinion used to be that the thymus increased in size to the second year, after which time involution began. Hammar's careful researches, however, show that growth continues to puberty, after which time involution begins and that, although there is gradual reduction of the parenchyma, some functioning parenchyma remains, as a rule, even in old age. However, accidental involution may occur at any age period, when there is loss of weight or inanition.

As far as the physiology of the gland is concerned, little is known. Many functions have been ascribed to it, but so far none have been confirmed. The recent work of Park and McClure has practically refuted all claims made by previous observers. They conclude that the thymus is not essential to the life of the dog. While extirpation produced no detectable alteration in the hair, teeth, contour of body, muscular development, strength, activity or intelligence, they could not definitely say that there did not occur retardation of growth or a delay in the closure of the epiphyses.

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

Hammar's investigations, which by the way are the most painstaking ones we have, offer no conclusive evidence that the thymus gland produces an internal secretion. The gland has been found to bear a distinct relation to the size, state of nutrition, and health of the infant. For instance, in inanition the gland is small, while in large babies it is increased in size. The present day conception of the thymus is that "it functions as a lymphoid organ in infancy and childhood, when large numbers of lymphoid cells and leukocytes are needed to combat infections." The large numbers of leukocytes, and especially lymphocytes in the blood during this period, indicate this. The general consensus of opinion today is that the thymus cannot be considered as an internal secretory gland, but is to be classed with the lymphoid organs and is perhaps associated with nuclein metabolism.

DISEASES OF THE THYMUS

Clinically there are only a few pathologic conditions of interest. Congenital absence has been described in conjunction with other anomalies. Atrophy is physiologic after puberty but is found in infants dying in a state of malnutrition. Tumors of the thymus are occasionally found in the form of sarcomata, teratoid growths or thymomata. Syphilis occasionally attacks the thymus, forming Dubois' abscess.

Enlargement of the thymus, however, is of paramount importance, and will take up practically all of our time today.

THYMIC ENLARGEMENT

According to some, thymic enlargement is supposed to be a rather rare condition, but to those of us who have been interested in the problem such is not the case. In fact, the condition is common, if it is systematically searched for. In the newborn enlargement is found in 40 per cent, but such enlargement is not symptomatic in this number. The frequency of enlargement decreases with the age.

The pathology consists chiefly of hyperplasia of the lymphoid elements. This enlargement may be generalized or chiefly affect only the upper or lower portions of the gland. The increase in size may be in the breadth or thickness. Increase in thickness anteroposteriorly is probably of much more importance from the standpoint of clinical symptoms than is the increase in other directions.

The cause of the symptoms has been a subject of much discussion for many years. At the superior opening of the child's thorax the anteroposterior diameter measures only 2 cm. from sternum to vertebral column, and this space contains the trachea, esophagus, great vessels and nerves, and the thymus. Obviously a thickened thymus would cause compression of the structures behind it, and such pressure signs are seen frequently in the trachea. Again, with a tracheoscope flattening has been seen. Hammar does not agree that such pressure occurs. Pressure upon the great vessels is entirely possible, and upon the nerves passing behind the thymus, especially the recurernt laryngeal. It seems more probable and logical that the thymic symptoms, which are asphyxial in nature, are caused by direct pressure upon the trachea.

To show how chaotic the literature is in regard to the thymus, I will mention some recent findings made by Boyd of the University of Minnesota. He found the normal weights of the thymus in well nourished children was 13 grams at birth, 20 grams at six months, and 35 grams at thirteen years; while in the poorly nourished it was 8 grams at two weeks, 6 grams at six months, and 13 grams at thirteen years. He also has found what he calls normal-sized glands in children supposedly dying of status thymicolymphaticus.

Regardless of the confusion at hand, clinically one is satisfied that there is a chain of symptoms associated with the thymus gland and this will always be hard to deny.

SYMPTOMS

The cardinal symptoms of thymic enlargement are dyspnea and stridor. Dyspnea is either continuous or remittent. The continuous form is most often seen in very young infants. The respiratory difficulty increases until the child goes into a suffocative attack, followed with intense cyanosis. These attacks may come on without warning or, as often is the case, after crying spells, especially if the head is thrown back. The attacks come with more or less frequency, and death may occur during one of them. Between attacks the dyspnea is continuous. The intermittent form is usually found in older infants. The child is suddenly seized with severe dyspnea, cyanosis and convulsive movements of the extremities, only to return quickly to normal. These attacks may occur infrequently at first but later appear more often.

Both the continuous and intermittent forms may vary greatly in their severity. Sometimes the attacks are so short and infrequent that it is extremely difficult to make anything out of them from the history told by the parents. I remember one of the first cases I saw in Salt Lake. The child of eight months was awakened from its sleep by a choking attack. When I arrived upon the scene, it was cyanotic, gasping for breath, and with each inspiration there was a decided crow. The child seemingly could breathe best when its head was held in a straight line with the body and the neck propped up with a small pad. This attack lasted fifteen minutes and two more occurred that night. The roentgenogram confirmed the diagnosis and furnished the method of treatment.

The second symptom is stridor, usually of an inspiratory nature. This may be present from birth or may develop later. Often it is only heard during crying spells, when a crowing sound appears with inspiration. At other times the sound is of a clucking nature. Once heard it will never be forgotten, but it is nearly impossible to adequately describe it. Once a mother called me up to describe a peculiar noise that her six months old infant was making. Unable to make head or tail out of her description, I was able to immediately diagnose a thymic stridor when she brought the baby to the phone. When dyspnea is present the stridor is very definite, but in the milder cases one cannot always detect a stridor at the first examination.

Congenital stridor and enlarged thymus are very frequently associated but all cases of congenital stridor do not have enlarged thymuses. Stridor may be due to a laxity of the epiglottic folds, or a peculiar malformation of the larynx or incoordination of the vocal cords. Stridor should not be considered absolutely pathognomonic but should lead one to search for thymic enlargement. One will often notice a slight inspiratory obstruction in very young infants when crying, which is, no doubt, due to the loose epiglottic folds. If this is at all marked, a roentgenogram of the thymus is indicated, especially if the baby is large.

Two years ago at the Salt Lake General Hospital clinic, as the mother of a baby I had previously examined left the hospital, I heard the peculiar clucking sound so suggestive of thymic enlargement. I told the nurse to have the mother come in the next day, as the x-ray machine happened to be out of order on this particular day. At the next clinic the nurse informed me the baby had died suddenly early the next morning. You all are familiar with such histories.

Another case I can mention is that of a prominent family in Salt Lake. The child of eight months, an exceptionally well developed baby, was given a bottle at 10 p.m.. one night. The mother stepped out of the room for a short time, and upon her return found the baby dead. It was thought at first that death was from aspiration of the milk, but upon examination a huge thymus was found and the lungs were free of any aspirated milk. The attending physician was kind enough to show me the specimen of the thymus which weighed 90 grams. While we all have our accidents, I feel certain, if we were always on the lookout for enlarged thymuses, the incidence of such accidents would be minimized.

There are a few conditions rarely considered to be associated with the thymus but which at times seem to be connected with thymic enlargement in some way. As a rule, "thymic asthma" is taken to mean the obstructive symptoms which I have just discussed. However, I have found in a few instances that children with what clinically appears to be bronchial asthma may have enlarged thymus glands, and when these are treated the asthmatic wheezing ceases, or at least is improved.

Such an instance occurred in my own family. The child had eczema in the latter half of the first year, and at about the age of one developed what to all intents was a true bronchial asthma. This continued for over six weeks. On x-ray examination the thymus was found to be greatly enlarged. After the first x-ray treatment the wheezing stopped and the child has had only one attack of a half hour's duration since.

Another child of two and one-half, with a history of having infantile eczema, developed a mild bronchial asthma during his second year. The usual protein sensitization skin tests were made without obtaining any information as to the cause of the asthma. On physical examination no evidence of thymic enlargement was found, but a roentgenogram showed moderate enlargement, one of the so-called border line cases. X-ray therapy was tried, more for want of anything else to do, with surprisingly favorable results.

I am not asserting that an enlarged thymus is the cause of asthma but I feel that there is in a few cases, probably a very few, some association between the two conditions. The possibility that enlarged peribronchial lymph glands may play a part in those children with chronic lung disease must be borne in mind, and it is not impossible that the two together are sufficient to cause pressure on the trachea or recurrent laryngeal nerve.

Breath-holding is an extremely common complaint and frequently it is on a neuropathic basis. However, in not a few instances one finds that an enlarged thymus is present. What probably happens is that the thymus becomes transiently engorged during a crying attack, with the result that the trachea is compressed. In those cases of breath-holding with enlarged thymus glands, treatment with the x-ray is successful.

PHYSICAL SIGNS

The determination of the presence of an enlarged thymus by physical examination is not positive. Inspection is of no value unless the symptoms of mechanical obstruction are present. Palpation of a mass in the suprasternal region is not always possible. On percussion, dullness over the thymic area may be found but this is often missed. In young children the thymic dullness is in the shape of a triangle, the base being at the sternoclavicular junction and the apex at the second rib, the sides extending slightly past the sternal borders. If the dullness is more than a centimeter beyond the sternal border, the gland is considered enlarged. Both heavy and light percussion should be used. The "threshold" method of percussion, which consists of light percussion strokes beginning well out on the chest and coming in towards the sternum, is usually valuable. The strokes should be so light that the ear must be held within a few inches of the chest. At the point where the sound disappears the thymic dullness begins. During percussion the head should be retracted slightly with a pad at the back of the neck so that the gland may more closely approximate the chest wall. Dullness caused by the great vessels and lymph glands may be confused with thymic dullness.

Bronchoscopic examination has enabled skilled observers to demonstrate the existence of tracheostenosis in some cases, but the method, of course, has only limited use.

X-ray examination affords the most information about the size of the thymus. Shadows extending beyond the vertebral transverse processes are usually considered enlarged. The thymic shadow includes that made by the great vessels and paratracheal glands. When the latter are enlarged, confusion may occur. There is one factor that must be taken into consideration. With expiration there is an increase in the size of the shadow, while with inspiration there is a decrease. This is probably due to pressure on the thymus. Therefore, it is best to take several roentgenograms for comparison.

When the anteroposterior view shows no enlargement, it is entirely possible that the pressure symptoms may be due to excessive thickness. A lateral view will sometimes show this. Finally, while x-ray evidence may be negative, this should not be taken as absolutely final in the presence of definite symptoms, for it is difficult to obtain much information concerning the thickness of the gland by this method.

With the advent of x-ray therapy the mortality of this condition has been greatly reduced until now the prognosis in cases recognized early enough is exceedingly good.

TREATMENT

X-ray therapy is the treatment of choice, although radium is used to some extent. The treatments are usually given one week to ten days apart until the shadow has decreased in density rather than size. Improvement is usually noticed in twenty-four to forty-eight hours. The number of treatments necessary, of course, varies, but with bold treatment surprising reduction in the size is obtained in three to six doses. The treatment is checked by fluoroscope or film and the patient should be examined occasionally throughout the course of several years.

STATUS THYMICOLYMPHATICUS

This is a constitutional anomaly, whose outstanding features are hyperplasia of the lymphoid structures in the various parts of the body—thymus, tonsils, lymph nodes, spleen and intestinal lymph follicles. The lymph glands show a lymphocytic increase and a peculiar necrosis of the germinal areas. There is marked hypoplasia of the cardiovascular system, and developmental deficiencies in the genitalia. The condition is often associated with sudden death, but is compatible with life. The condition is extremely dangerous because of the liability of its victims to fatal anphylactic shock from sensitizations through an impaired lymphoid apparatus, because of the lowering of resistance to infection, and because of the cardiovascular hypoplasia.

Clinically there are two types: (1) The delicate featured, clear skinned, well proportioned but small child with transparent sclera and silky hair; (2) the coarse, pasty-skinned child with recurring eczema and rickety manifestations.

Symmers describes the true form which includes the description given above, with especial mention of the overdevelopment of the lymphoid structures, the hypoplasia of the genitals, and the feminine type of figure; and the recessive type marked by atrophic changes in the lymphoid tissues.

While this condition has been accepted for many years as a clinical entity, it has been done so with reluctance, as the literature is extremely confused in many respects. Status lymphaticus at present needs to be thoroughly investigated with the hope that more definite information be obtained, and many obscure ideas about it be abandoned.

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HYPERTROPHIC PYLORIC STENOSIS *

OCCURRING IN PREMATURE TWINS

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There is nothing unusual about this report except that the condition occurred in twins and they were premature.

I have had two families in which pyloric stenosis occurred in two consecutive male children. Moore[1] of Dallas, Texas, in March, 1924, reported a case occurirng in twins. Davis[2] in the *J. A. M. A.* reported, August 30, 1924, this condition occurring in twins born in 1919. Cantley[3] reported a case occurring in a seven month fetus.

The children,† the subject of this paper, were born April 3, 1921, two months premature, males, weighing four pounds four ounces, and four pounds respectively. Merval, weighing four pounds four ounces, gained in weight and progressed satisfactorily until April 24, when he weighed five pounds four ounces. He then began to vomit and show the classical symptoms of pyloric stenosis. He lost weight rapidly and was operated on May 3, the thirtieth day of life. A typical tumor was found at the pylorus. A Ramstead operation was performed but unfortunately the child died on the eighth day following the operation.

Burnell, the other child, did not show any symptoms of pyloric stenosis until May 13, when he weighed five pounds eight ounces. As this was the day of the other child's funeral, it was a little difficult for the family to consider the possibility of the second child having the same condition and the probability of an operation. However, projectile vomiting became pronounced. Peristaltic waves were marked. The child lost considerable weight and such a serious condition developed that the family consented to an operation, which was performed by Drs. Bodine and Cantril on May 23. A typical tumor was found. Ramstead operation was performed and the child made an uneventful recovery.

The etiology of hypertrophic pyloric stenosis still remains unsolved. The hypertrophy is undoubtedly congenital, as it does not seem possible that so large a tumor could develop within a few weeks. However, it is extremely rare for symptoms to develop before two weeks and often not until six or eight weeks. Undoubtedly a spasm develops upon an existing hypertrophy because, if the symptoms were due entirely to a mechanical obstruction, vomiting would occur early, just as soon as the child receives food.

Keilman[4] makes a statement that there is a form of congenital hypertrophy of the pylorus which does not cause any symptoms. Typical clinical cases without anatomic basis and typical anatomic findings without symptoms are now known. Spasm and hypertrophy, therefore, are not absolutely combined, but their coincidence is so much more frequent than the contrary. He raises the question, how can we explain why the hypertrophic pylorus is associated with spasm so much more frequently than the normal pylorus?

Paul,[5] in considering this condition, states that it is probably a local affection of the nerves of the stomach outlet, that is, a disturbance of balance in the sympathetic and parasympathetic intestinal nervous system. The sympathetic system transmits inhibiting impulses; the parasympathetic system stimulating impulses to Auerbach's plexus which regulates the automatism of the stomach. As gastric peristalsis is stimulated by the vagus, it seems reasonable to attribute pyloric spasm to an irritable condition of this nerve.

Many hypotheses have been suggested as a solution of the etiology. Most of the cases do not show symptoms for several weeks, but Keyser[6] has reported an unusual case, where vomiting occurred fourteen hours after birth which was persistent, occurring after each feeding. The child was operated upon the fifth day and the usual hypertrophic pylorus was found.

A great deal of literature has been written differentiating between pylorospasm and congenital hypertrophy. Many observers do not believe in spasm of the pylorus as a clinical entity.

In the past I have been skeptical regarding the probability of a child having symptoms sufficiently marked to consider the possibility of an operation, that did not have at operation a typical muscular tumor the size of an olive. I have had over sixty cases in the last fifteen years and have felt secure in my view. However, recently I have had reason to modify my view. A child with all the classical symptoms and with a marked and rapid loss of weight was found at operation to have a normal pylorus.

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* Read before the North Pacific Pediatric Society, Seattle, Wash., Aug. 31, 1927.

† Case referred by Drs. Bodine and Cantril.

Pylorospasm does occur, but it is very unusual and not nearly so common as hypertrophic stenosis. It is very rare for a case of pylorospasm to have symptoms so marked that would justify an operation. It is true that the two conditions resemble each other very closely, but the symptoms are a matter of degree.

In pylorospasm the symptoms are not so marked. There is vomiting, projectile in character, and loss of weight, but the child generally has bowel movements that contain a fair amount of fecal residue. Peristaltic waves are present and can be as large as those of true hypertrophy.

There are two important points in differentiating conditions. In a well developed case of true hypertrophy practically no food passes by the pylorus. In spasm the food may be retained longer in the stomach than normally, but if vomiting does not occur, the food will eventually pass into the duodenum.

In true pyloric stenosis a tumor can often be palpated. However, there is the greatest variation in the ability to palpate the tumor. Some pediatrists report positive findings in nearly one hundred per cent, while other skilled clinicians, reporting a large number of cases, found a palpable tumor in only twenty-five per cent. When found it is a most valuable sign. Fedinski[7] states that in cases in which no results can be obtained with therapy, in which there is a progressive loss in weight, operation is justified even in purely nervous spasm.

Morse[8] states surgical intervention for the relief of pyloric spasm is seldom necessary and should only be tried when it seems certain that the baby will otherwise die. Theoretically it would seem that splitting the pylorus would prevent its spasmodic contraction. However, it very often does not relieve the symptoms and very often the babies are worse after than before the operation. Richter[9] of Chicago, a surgeon of considerable experience who has been greatly interested in pyloric spasm, states that to perform a pyloroplasty or gastrojejunostomy upon a patient whose pylorus is patent for the purpose of relieving an obstruction is utterly illogical.

Undoubtedly it may be difficult at times to determine absolutely whether a child has pylorospasm or a congenital hypertrophic pyloric stenosis. However, I feel that the crux of the whole situation depends entirely on the condition of the child. If he is losing weight rapidly it is best to advise an operation without further delay, even though an error in diagnosis is made. No one is justified in continuing to treat the case medically so long that the child becomes a poor surgical risk, because with surgery the most brilliant results are obtained, nearly one hundred per cent recoveries, if diagnosed and operated upon early.

Within twenty-four hours after the operation the child is on the high road to recovery, and he has the great advantage of maternal nursing. On the other hand, when an attempt is made to treat the child medically the mother almost invariably loses her milk.

Tisdall[10] states that the average duration in hospital for operated cases is sixteen days, as compared to fifty-three days in a group of cases treated medically.

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GOITER IN NEWBORN INFANT

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Goiter in the newborn is sufficiently rare to occasion more than ordinary interest. I desire to place on record a case in which the enlargement at birth was about one-fourth the size of the infant's head. It was located in the right lobe of the thyroid and was probably the cause of the face presentation at parturition. My colleague, Dr. J. E. Toothaker, was the accoucheur in attendance and had no difficulty with the delivery. The case was a multipara. The child weighed eight pounds at birth.

The mother had a colloid enlargement of the thyroid which had been present since the birth of her first baby eight years previously. Shortly after the delivery the mother was given iodized calcium lactate. The infant was breast fed. In nine weeks the enlargement had disappeared from the necks of both infant and mother and at three months of age the child is an exceedingly healthy youngster. The Sweet Clinic.

EXAMINATION OF OVER 3,000 SCHOOL CHILDREN FOR HEART DISEASE*

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The importance of systematic physical examination of school children is obvious, for 75 per cent of children who have had inflammatory rheumatism and 40 per cent of those who have had St. Vitus dance develop heart defects; preventable, but when once started, health and life may be endangered. One child in five, ten years of age, will eventually die of heart disease. The American Heart Association advises that every child admitted to the public schools should have a physical examination, that every child with suspected or definite heart disease should be carefully studied in view of correcting nutritional defects, bad teeth, diseased tonsils and adenoids, etc. In New York City teachers are instructed by the Board of Education to issue special passes to permit children with heart disease to enter or leave school directly before or after the regular time schedule for normal children, to excuse cardiac children from physical training and fire drills and to lengthen the lunch period in order to prevent hurry in eating, or to revise the individual regime upon the receipt of a report from the family physician. Children with heart disease are segregated in special classes so far as is possible. Growing pains, nervousness, rheumatism, repeated colds and tonsillitis are looked upon as possible indications of heart disease. In 250,000 physical examinations in New York City 20,000, or 1.6 per cent, showed heart defects.

For several years grammar grade pupils in the Portland schools have had a spring track meet and competitive games. One of us (H. A. C.) in the capacity of school physician has been impressed with the importance of physical examinations of children. Each year there have been a few of these children who have collapsed while competing in these games.

There are several factors which make it desirable to examine children of grammar school age before they are allowed to take part in competitive athletics. There is a nervous tension which affects the circulatory organs; there may be defects of which child and parents are unaware. Children are ambitious to excel.

In 1924 four children collapsed in the preliminary track meets because of poor physical condition; no examinations were made at that time so the cause is unknown. In 1925, at one of the largest grammar schools, some boys were playing tag, all apparently in good physical condition. One boy tagged another and, when the latter turned to run, he fell dead. One child appeared for examination to enter the track meet, whose health had been such that he had been in an open air school the past year. A boy wanted to enter the hurdle races who was on crutches! Another said he would not enter this year because he "was all in" after the meet last year. These incidents made it possible to arrange for the physical examination of all children who were to enter the track meets in 1926.

The examinations were undertaken with the following objects in view: (1) To ascertain which children could safely enter. (2) To ascertain the incidence of organic heart disease in supposedly well children. (3) To study those with heart defects as to etiology, extent of the lesion, evidence of heart strain and reaction to exercise. (4) To determine, if possible, what nervous strain incidental to competitive athletics in children might have to do with apparent heart weakness.

Technic of the examination. Permission to conduct the examination was granted so late that it was necessary to complete examination of this large number of children in eight school days. This necessitated a large corps of examiners, preliminary recording to past illnesses, height and weight and answers to certain questions which would be of value in studying all the data when completed.

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

This information was obtained by a school nurse before the child came up for examination (fig. 1).

At the time of the examination the children were brought to the examiner in groups of ten or twenty and prepared for the examination, with a recorder to fill in the reverse side of the card (fig. 2) as the examiner dictated the findings. The general appearance, condition of cervical and axillary glands, the condition of the thyroid and the heart rate were noted quickly and recorded. The heart size was determined by palpation and percussion; the heart sounds with the child standing were noted. The child was then asked to hop vigorously twenty times on each foot, at the end of which time the examiner applied the stethoscope and dictated his findings to the recorder. After a three minute period the stethoscope was again applied and the heart rate counted. In this way a large number of children could be examined in a comparatively short time, sufficient examiners being sent to each school so that the daily program of the school was not interrupted for more than one to two hours, depending upon the number of children to be examined and, as a rule, a single room was not interrupted for more than one period.

EXAMINATION OF SCHOOL CHILDREN

Name ....
Surname Given Name
Date.................. School..................
Age...... Sex...... Weight: Actual.......... Normal..........

Past History:
Severe Illnesses: What.................. When..................
Rheumatism.................. St. Vitus Dance..................
Influenza.................. Whooping Cough..................
Scarlet Fever.................. Diphtheria..................
Measles.................. Tonsillitis..................
Frequent colds..................
Any heart disease in family?..................

Questions:
Have you ever had palpitation?..................
Heart turn over?..................
Are you short of breath?..........with exercise..........
Do you ever have any chest pains?..................
With exercise ....
Do you have indigestion?..................
Do your feet or ankles ever swell?..................
Do you have growing pains?..................

FIG. 1

Examination:
General apppearance:
Normal.......... Pale.......... Underdeveloped..........
Glands: Cervical.................. Axillary..................
Thyroid: Enlarged.................. Normal..................
Heart rate..........Left border. Normal.......... Out..........
Tones: ....

Exercise Tolerance:
Pulse standing..................
Pulse after 20 hops on each foot..................
Pulse three minutes later..................
Tones after exercise: Same..........Change..........
Edema of ext..................of face..................
Size of liver..................
Character of Neck Veins:
Enlarged and dilated..................
Pulsations ....

Summary:
Heart disease: Yes.................. No..................
Valves involved..................
Decompensation ....
How marked ....
Normal activities are restricted..................
are not restricted..................
Suggested etiology ....

Diagnosis ....
Nurse.................. Examiner..................

FIG. 2

TABLE I

Excluded from track meet	208
Poor exercise tolerance	171
Refused examination or absent	37
	208
Valvular lesions	193
Endocarditis, chronic	15
Murmurs at pulmonary valve area	178
	193
Fainted during examination	5
Endocrine disease other than goiter	4

Results of the examination. Of more than 3,000 children examined, 171 were refused permission to enter the track meet (Table I). Some of these were free from organic heart disease, but were excluded because of nutritional defects or poor exercise tolerance. Underweight was noted by one of the school nurses to be less common in the winter than in the spring, which may be due to increased activity, nervous fatigue, etc., as the school year progresses. Five children fainted at examination, probably due to nervous factors.

One hundred and ninety-one of 3,000 school children were found to have heart murmurs. It is interesting to note that in 92 of these the murmurs were not apparent until after exercise. Of the 191, fifteen were found in whom chronic rheumatic heart disease was a factor. A surprising thing was the frequency of murmurs at the base of the heart, particularly over the pulmonic valve area. These were usually systolic, possibly of little significance because the children had good exercise tolerance and appeared to be healthy. There is normal tachycardia after exercise or it may be a bit above the average but returns to normal in the usual time. Often this murmur is loud and rasping. Among our examiners it was usually confused with mitral systolic or aortic systolic murmur but in looking over the records it is often noted that after exercise the murmur is louder and heard with equal intensity over the mitral and pulmonic areas, or is loudest at the pulmonic area or is heard well over the aortic area. That it is not due to aortic stenosis is obvious. There is no history of severe illness, and the child shows no cardiac symptoms. That the murmur is not due to congenital defects (pulmonary stenosis, patent ductus arteriosus) seems obvious, when one remembers the rarity of these defects at the postmortem table.

Following this extensive and hurried study of 3,000 school children in the spring of 1926, it has been possible, through medical cooperation with school principals and a lessened prejudice on the part of some parents as to physical examination of their children, to carry on more systematic study of the school child. The results of this are seen in Table II, where it is noted that 365 children were found during the school year of 1926 and spring of 1927 with defective hearts; 106 were found with definite pulmonic systolic murmurs. Five hundred and thirty-three children were examined for a track meet in the spring of 1927 by the school physician. Incidentally it may be interesting to note the number of children with defective vision, hearing, nose, throat, and orthopedic conditions. It is also interesting to note the incidence of goiter (Table III) and the corrective measures (Table IV) carried in the school year from 1926 to the spring of 1927.

TABLE II

RESULT OF DOCTORS' EXAMINATIONS

1926-1927

Number free from defects	1502
Defective vision	1661
Defective hearing	423
Defective nose	412
Defective tonsils	3045
Orthopedic	1574
Defective heart	385
Pulmonary defect	146
Toxin-antitoxin	8103
Goiter examinations	8066
Track examinations	2533

TABLE III

6648 GOITER EXAMINATIONS

1926-1927

Normal	4867
Slight enlargement	1607
Moderate enlargement	94
Large	4

TABLE IV

CORRECTIONS

1926-1927

Vision	765
Nasal	125
Tonsillectomy	1,257
Orthopedic	63
School consultations with parents	8,503
Home visits	6,616
Number weighed	64,040
Number 7 per cent underweight	9,829
Goiter tablets given	170,990
Conference with teachers and principals concerning child	23,563

Conclusions. The incidence of heart disease in grammar school children in Portland is surprisingly small. As compared with the Atlantic seaboard, acute rheumatic fever is not common. This has not been intensively studied by pediatricians on the Pacific Coast, so far as we know, but should be investigated. Another factor which may influence the incidence of heart disease in the school children of Portland may be the generally comfortable economic condition of their parents, since there are but few paupers and the number of charity patients in hospitals generally is small. At the Portland Free Dispensary, under the supervision of the Medical Department of the University of Oregon, the pediatric clinics are large but the attendance of school children of this age is comparatively small. Another factor which may be considerably important is the general information of the public in regard to health matters and the stress that has been laid in recent years upon diseased tonsils as possible sources of infection.

The incidence of murmurs over the base of the heart was a surprise to the examiners. A good exercise tolerance in these children is further evidence of the long recognized lack of importance of these murmurs.

Another factor which must be taken into consideration is the obvious nervous tension which some of the children show during a physical examination and which is much heightened in competitive athletics because of the desire to win. On the whole, we are of the opinion that the track meets and competitive games are beneficial rather than otherwise, if preliminary physical examination can be made and if, at the time of the track meet, physical directors, school physicians and assistants, and nurses can be on the alert to note abnormalities in the contestants.

PRECOCIOUS PUBESCENCE AND MENTAL GROWTH. Arnold Gesell, New Haven, Conn. (*Journal A. M. A.*, March 17, 1928), concludes that precocious displacement of pubescence does not carry with it a coordinate deviation in the curve of mental growth. Stature and physical configuration are apparently more affected than the nervous system and the functions which underlie mental maturation. He supports his conclusion with the report of two cases. He says that growth is not a homogeneous, indivisible process which is chiefly conditioned, by sexual development and differentiation. Growth is a complex of many components. The components interact, but there is also a high degree of specificity, even of independence, among these components.

MANAGEMENT OF STRABISMUS *

A PLEA FOR THE EARLY TREATMENT OF THE CONVERGENT TYPE

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The importance of the early recognition and treatment of strabismus cannot be overemphasized. The unfortunate and erroneous notion that strabismus should not be treated until puberty has pervaded the ranks of the medical profession, and resulted in the neglect of many cases that might have otherwise benefited by intelligent early supervision and treatment. This false idea originated years ago, when indiscriminate tenotomies were done on the internal rectus muscle without an understanding of the underlying cause of the squint, and disregard of important anatomic structure of the extraocular muscles.

When Dieffenbach, in 1839, first performed his operations for convergent strabismus, he divided the belly of the internal rectus muscle. The secondary divergence was so pronounced that the operation was abandoned for many years. Later Böhm proposed dividing the tendon instead of the muscle and Von Graefe perfected the technic of regulating the effect of the operation. Since then the possibilities of correcting squinting or crossed eyes by operation and other methods of treatment have been better understood.

It is in children with convergent strabismus that most can be accomplished by early treatment. For this reason the pediatrician and general practitioner should be familiar with the possibilities of improving such cases. As most cases of strabismus are usually taken to the family physician first, he should be in a position to give sound advice regarding treatment.

Of the several types of squint, the convergent variety occurs most frequently in early childhood. In the majority of cases it is of the accommodative type and the early correction of refractive errors, usually hyperopia or combined hyperopia and hyperopic astigmatism, eliminates the underlying cause, thus correcting the deviation. To defer treatment in these cases frequently results in amblyopia ex anopsia, which is partial or serious loss of vision in the deviating eye, and a serious secondary contraction of the ocular muscles that will not yield to the simple wearing of correcting lenses. Therefore, it is imperative that all infants over eight months or a year of age, who develop intermittent or constant strabismus, should be referred to a competent ophthamologist for careful examination and treatment.

It might be well at this juncture to discuss briefly the mechanism of convergent squint in cases with hyperopia and hyperopic astigmatism, the so-called accommodative strabismus. In the normal or emmetropic eye the approximately parallel rays of light that come from infinity enter the eye and focus on the retina without accommodative effort. The rays that emanate from points within infinity are divergent and require the act of accommodation to concentrate and focus them. At the same time the eyes converge to a point that will direct the visual axis of each eye to the object that is under observation. This dual function of accommodation and convergence go hand in hand. In the emmetropic eye, objects at one meter require one diopter of accommodation and one meter angle of convergence of the visual axes. For one-half meter's distance twice as much of each is required, etc. The association centers in the brain control this phenomenon.

In high hyperopic errors parallel rays of light will not focus on the retina. In order to see clearly, the eye accommodates and at the same time the associated impulse for convergence is emitted. This obviously will throw the visual axes out of alignment and cause the eyes to converge to the number of meter angles that corresponds to the required number of diopters of accommodation. In other words, the eyes turn in farther than is normal. This explanation of the development of squint seems quite simple. It does, as a matter of fact, explain the mechanism in some cases. However, there are persons with high hyperopic errors, who never develop squint and who see distant objects clearly after using the required amount of accommodation. This can be accounted for by their having a highly developed fusion faculty.

With a deviation of the visual axes, a troublesome diplopia occurs, which the individual makes every possible subconscious effort to overcome. If he has a powerful latent fusion faculty, and is in good health, the diplopia will be so distasteful to his consciousness that he will exert enough nervous force to suppress the strong convergence impulse that accompanies the added accommodation that is necessary to overcome the hyperopia. It is by this means that he keeps the eyes parallel. If, however,

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his nervous energy is decreased by some acute illness, he may not be able to sustain parallelism and squint develops. Others, with a poor or no fusion faculty, are equally troubled by diplopia. They cannot overcome it by bringing the eyes parallel, but soon learn to suppress the image of the deviating eye. If this occurs early in life, the retinal perception elements fail to develop their normal physiologic function; the vision remains poor permanently and amblyopia ex anopsia occurs in the deviating eye. After the eye deviates for a short period of time and secondary contraction of the muscles occurs, the squint becomes increasingly more difficult to overcome by simple measures.

If the condition is recognized in its incipiency, much can be done by correcting the refractive error which will eliminate the tendency toward strabismus, and prevent the deterioration of vision in the squinting eye. For infants fourteen months of age who had beginning strabismus, I have prescribed lenses which corrected the squint. In these cases the retina developed normally and the vision remained equal in both eyes. Small children soon learn that they are more comfortable with their correcting lenses and little or no urging is required by the parents to make the child wear his glasses.

If cases are neglected and amblyopia ex anopsia develops, it is often impossible to restore the vision of the affected eye to normal. The prognosis for improvement or cure by simple measures grows proportionately poorer with age.

The procedure that should be followed by the opthalmologist in early convergent squint is: First, the determination of the visual acuity of each eye; next, the nature and degree of the squint; whether it is intermittent or constant; and whether the squint is of the alternating or fixed type. The state of the media of the eye and the fundi should be determined in order to eliminate congenital opacities, disease or anomalies. The refraction should then be accurately measured by the shadow test after the accommodation has been entirely paralyzed by atropine. If the child is old enough to cooperate, subjective refraction on the range should be done to verify the skiascopic findings. Tests for binocular vision should be made also.

If a hyperopic error is found, it should be fully corrected with lenses, and the glasses worn constantly. The latter must be insisted upon. If amblyopia ex anopsia is present in the deviating eye, and it is not improved by the simple wearing of lenses, an attempt should be made to improve its vision. This is accomplished by covering the good eye each day for varying periods of time and requiring the child to use the defective eye entirely. Atropine in the better eye may also be used for this purpose, but it is not so effective as a well adjusted patch.

Many cases with strabismus are improved or cured by the wearing of accurately fitted lenses. The eyes, of course, will deviate with the removal of the glasses.

Often fusion exercises aid greatly in teaching the patient to use both eyes together. The amblyoscope, an instrument with which dissimilar objects may be seen with each eye separately, is used for this purpose. The images are fused by moving the tubes that are hinged near the center. The stereoscope and other devices are also used for this purpose. If, after the use of lenses and exercises for six months or a year improvement does not occur, an operation may be considered.

It is unwise to attempt to operate too early because sufficient cooperation cannot be obtained from the patient to be sure that fusion exercises, etc. have been effectually carried out. In most cases it is not advisable earlier than the sixth year. It is often unwise to defer the operation to the fourteenth or sixteenth year because the child's habits have become more fixed and a readjustment of coordination will not take place as readily as in younger persons.

It is a good rule to advise an operation in convergent strabismus as soon as one is certain that correcting lenses, fusion exercises, etc. will not effect a cure. It is better to employ a local anesthetic so that the degree of correction can be measured more accurately. This, however, is not absolutely essential, if one carefully determines the degree of the squint and regulates his tenotomy or advancement accordingly.

The best operative procedures to employ should vary with the experience and skill of the surgeon. In unskilled hands the tucking operation is less dangerous. Advancements and recessions require greater care because of the danger of perforating the sclera at the time that the sutures are inserted.

With convergent strabismus in children the aim should be to obtain a slight under- or fullcorrection, never an overcorrection. With divergent squint an overcorrection is desirable. At least six weeks must elapse before one can feel reasonably certain of the ultimate result. It is always necessary for persons with high hyperopia, with or without astigmatism, to wear correcting lenses after the operation.

Alternating convergent strabismus offers a poorer prognosis than the constant type, because in many cases a fusion faculty is not present, and, even though the visual axes can be brought into a more favorable position, the patient cannot learn to use both eyes together. Fusion training before and after the operation is exceedingly important in favorable cases of alternating squint.

The management of divergent strabismus differs from the convergent type. Unlike convergent squint, it does not usually develop in early life. It does not occur as a rule in persons with hyperopic errors, but is often seen in high myopia. It is frequently found in blind eyes and in eyes with opacities in the refracting media.

In myopia the error of refraction should be corrected. This, however, rarely relieves the condition and an operation is necessary. These cases offer a good prognosis. If the divergence is due to an opacity in the media, other than a cataract, the prognosis for improvement is poor.

As has been emphasized before, a slight overcorrection should be the aim when operating for divergent squint. This is because this type of deviation has a tendency to increase. The opposite is true in convergent strabismus.

Vertical squint is usually due to paresis, or to insufficiency of one of the elevating or depressing muscles of the eye. This type of strabismus is usually associated with disagreeable subjective symptoms, and treatment frequently gives marked relief. The vision usually remains the same in both eyes and the diplopia is overcome by tilting the head to one side. Because of the secondary contraction of the antagonistic muscles, the finding of the affected muscle is often difficult.

Advancement of the involved muscle or tenotomy of the antagonist frequently gives marked relief, and often corrects the torticollis. It is sometimes necessary to transplant the insertion of one of the vertical recti to correct the error. In mild cases prisms with their bases placed upward or downward in the correcting lenses give relief.

Paralytic strabismus offers greater difficulty in its management than the concomitant types that have just been described. The causes are many, but syphilis heads the list. Trauma, lethargic encephalitis, diabetes, focal infection, multiple sclerosis, lead poisoning, etc. are among the other causes.

At the onset of the paralysis the diseased muscle can be determined with ease, because the rotation of the eyeball is limited in the field of action of the affected muscle, and the degree of diplopia increases as an effort is made to rotate the eyes in that direction. In late cases secondary contraction of the antagonistic muscles occurs and the diagnosis becomes more difficult.

It is important to determine and to treat the cause. Prisms are of little value because the diplopia only occurs in certain fields and is not constant, but increases as an attempt is made to rotate the eyes toward the field of action of the affected muscle. It is only in old and stationary cases that an operation should be considered.

In some cases of long standing paralysis of the external rectus, or bilateral paralysis of the external recti muscles, the outer half of the superior and inferior rectus tendons should be transplanted to the insertion of the external rectus. Tenotomy of the antagonist of the other eye is of value in some cases of paralysis of a vertical muscle.

In ophthalmoplegia externa all of the extraocular muscles supplied by the oculomotor nerve are paralyzed. The diseased process is usually located in the oculomotor nucleus or in the trunk of the nerve. One must determine and eliminate the cause, as operative procedures offer little hope for relief. Fortunately ptosis accompanies this distressing condition, and the drooping lid obliterates diplopia by covering the pupil of the affected eye.

The heterophorias or latent squints have not been discussed in this paper. They produce asthenopic symptoms, and the patient usually consults the ophthalmologist. In this condition the eyes are parallel when both are uncovered. On covering one of the eyes the screened eye deviates in the direction of the latent squint. As these are primarily opthalmologic cases, further discussion of them will be unnecessary.

It is obviously impossible to fully consider the whole subject of strabismus in a short paper. It has been my desire to emphasize only a few salient points that are not clearly understood by physicians. No attempt has been made to discuss intricate diagnostic methods or operative technic for the correction of squint. I wish to impress upon you the paramount importance of early treatment; first, because normal coordination of the eye movements can be more readily obtained; second, because a better cosmetic result may be expected.

A crossed eye in an impressionable child is a serious handicap to the normal development of mentality and his reaction to every day life. He soon learns that he is different from others and early becomes a subject of ridicule. In a sensitive child this develops an inferiority complex that in many cases lasts throughout life. It is a factor that seems to have been overlooked by many ophthalmologists as well as by others. This is often of greater importance in the child's future happiness than the physical comfort gained by the approximation of the visual axes.

In conclusion, let me emphasize the following for convergent strabismus:

1. The necessity of investigation of the cause of strabismus immediately after it is discovered.
2. The necessity of fully correcting the hyperopia and hyperopic astigmatism, and insisting that the correcting lenses be worn constantly.
3. The desirability of testing for binocular vision, and the practice of orthophoric exercise before and after operation.
4. The necessity of covering or using atropine in the better eye in cases with amblyopia ex anopsia.
5. The desirability of early operation when other measures have failed.
6. The importance of wearing the correcting lenses after operation.

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Business of Getting Well. Lewis Hugh McKinnie, Colorado Springs (*Journal A.M.A.*, March 17, 1928), accuses the average American of being a poor partner in this matter of health; of showing poor judgment in the choice of his healers; of complaining of the high cost of illness and then wasting his substance on the worship of false gods, and of being an accessory before the fact in harboring unfounded superstitions and prejudices. However, the remarkable progress in the last quarter century could not have been attained without the loyal faith and generous assistance of a large and influential following. The many large associations in which laymen and physicians labor side by side for the alleviation and prevention of suffering mark a decided step forward in public support. The improvements in hospitals, institutions for research, and medical and training schools are further evidence. Public opinion is aroused and swayed to some extent by natural progress, but to a far greater degree by publicity and propaganda. Commerce and politics take full advantage of modern methods for reaching the masses. Individual or collective advertising to further the commercial side of medicine is obnoxious and unthinkable—it is almost a distinctive brand of charlatinism and quackery. On the other hand, organized efforts to further public health and preventive medicine cannot have any selfish or ulterior motive. Preventive medicine carried to the vanishing point would theoretically abolish the practice of medicine. Propaganda through the press does not appeal to the average medical organization. The best type of medical man instinctively holds himself aloof from the newspaper. Medical men have no patience with the omissions, distortion and inaccuracies common to the public press. Some of the misapprehension that appears in the press regarding patients might be prevented.

THE TONSIL PROBLEM*

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In a discussion of the faucial tonsil I am not unmindful of the fact that medical literature is voluminous with most every phase of the work. This has been particularly true of the tonsil as a source of focal infection, and the operative technic of tonsillectomy has been most liberally dealt with. The pathology has been discussed from all sides, and recently some very instructive reports of end-results have been published. This is the ultimate goal for which we are all striving.

For a moment I will review the embryology and then discuss the anatomy and pathology, this merely to bring the subject more vividly before you.

EMBRYOLOGY

The tonsil is developed in a primary tonsillar fossa, the sinus tonsillaris, which is formed by the elongation of the second pharyngeal pouch. It becomes marked at the beginning of the third month of fetal life, by the development of the palatal arches. At this time the sinus is narrowed by a small elevation, the tonsillar tubercle. At about the middle of the third month another fold appears, the infratonsillar fold (Hammar), which springs from the outer wall of the sinus. It divides the sinus into two fossae, a superior and an inferior, which become the points of development of separate tonsillar lobes. At the end of the fourth month of fetal life there begins to develop from the floor of each fossa solid epithelial sprouts which grow outward into surrounding fibrous tissue of the mucosa (Barnes[1]). Soon after their appearance they become hollowed through the degeneration of the central cells which form loose plugs and are gradually expelled into the faucial cavity. The result is a series of epithelial pits with open mouths, but which later are partly closed by development of the lymphoid tissue and they become long, narrow slits which we find in the mature tonsil, and are afterwards known as crypts.

Around these epithelial outgrowths the lymphoid tissue begins to develop from the superficial layers of the tunica propria. It is at first diffuse, having been found in the early months of fetal life (at the end of the fourth month) but is usually not found as follicular tissue until the seventh, eighth, ninth, tenth and eleventh months. The fossae are next developed by the tonsillar mass pressing outward on the walls of the sinus. It finally bursts through into the faucial opening of the sinus.

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The lmyphoid tissue of the tonsil is developed entirely within the more superficial fibers of the tunica propria of the mucosa. The deeper layers of the propria are pushed aside by this development and condensation takes place in them so that they form a thin, compact membrane, the capsule, surrounding the lymphoid mass on all sides not covered by epithelium. The lymphocytes of the tonsil, as well as other lymphoid tissue, are probably of mesodermal origin, but whether the migration from the blood vessels into the connective tissue is derived from the fixed cells of the mesoderm is not known.

ANATOMY

The tonsil is an irregular globular mass of lymphoid tissue, one on either side of the fauces in a recess, the sinus tonsillaris, which is formed by the palatal arches. It is the largest lymphoid structure either in the respiratory or the alimentary tracts. Externally, anteriorly and posteriorly it is enclosed in a fibrous membrane, the capsule. Internally it is covered by a mucous membrane.

The sinus tonsillaris is bounded by two columns or pillars, in the anterior fold of which lies the palatopharyngeus muscle. Beneath the capsule, in the floor of the fossa, is the superior constrictor of the pharynx. From a surgical point of view it is important to keep these muscles in mind, for when disregarded in removing the tonsil, unsightly scarring takes place as well as loss of function in the act of swallowing or in phonation.

There are two main types of tonsils, the pedunculated and the submerged. The pedunculated stands well out in the fauces, is mostly covered by mucous membrane and lies in a shallow fossa. It is usually smaller than the submerged tonsil, which lies invested in the tonsil capsule in a fossa much deeper than that of the pedunculated type. The average tonsil weighs from 40 to 50 grains. The largest one I have ever removed weighed 187½ grains.

The tonsil is an extremely vascular organ, receiving its arterial supply from the tonsillar and palatine branches of the facial, from the descending palatine branch of the internal maxillary, from the dorsalis linguae of the lingual and from the ascending pharyngeal. From a surgical standpoint the tonsillar and palatine branches of the facial are the most important, since they are largest and supply the great part of the tonsil. The dorsalis linguae supplies the anterior pillar and enters the tonsil at the lower pole. The ascending branch of the pharyngeal enters the posterior pillar in its lower half and supplies the pillar and lower half of the tonsil. At times this branch gives rise to troublesome bleeding. The descending pallatine sends a small branch to the superior lobe, which enters its external surface high in the fossa and supplies the superior part or upper lobe. I have never seen a severe postoperative hemorrhage from this artery. However, it may bleed freely when first incised.

The veins form a plexus lying in the walls of the sinus. The largest vessel runs down the palatopharyngeus muscle and empties into the veins of the epiglottis and pharyngeal plexus. This vein is often plainly seen after tonsillectomy and, if accidently severed, causes troublesome hemorrhage. The smaller one runs down the anterior sinus wall and empties into the lingual veins.

No afferent lymphatic stems have been demonstrated leading to the tonsils. The efferent lymphatics pass through the fibrous trabeculae and the capsule, pierce the superior constrictor muscle of the pharynx and empty into a large gland, one of the superior deep cervical nodes, lying under the anterior border of the sternomastoid muscle in the angle between the internal jugular and facial veins. When enlarged, it projects anteriorly beyond the anterior border of the sternomastoid muscle and appears one-half to three-frouths of an inch below the angle of the jaw.

The deep cervical nodes are divided into a superior and an inferior group. The superior nodes extend along the course of the internal jugular vein from the tip of the mastoid to the level at which the vein is crossed by the omohyoid muscle. They may also be divided into an anterior and a posterior group. The posterior glands lie deep under the sternomastoid or along the posterior border. They receive their efferents from the superficial nodes in the suboccipital and mastoid regions, from the retropharyngeal glands and also directly from the mucosa posteriorly, including that of the sinuses. Their enlargement, without involvement of the anterior glands, cannot be attributed to the tonsil. The anterior glands receive their afferents from the tonsil and the base of the tongue and from the submaxillary and submental nodes.

The nerve supply of the tonsil is derived from Meckel's ganglion through the middle and posterior pallatine nerves and from the glossopharyngeal.

The tonsil is composed of lymphoid tissue supported by a fibrous mesh work, the capsule, and trabeculae. The epithelium of the faucial tonsil covering the internal surface is of the stratified, squamous variety and is continuous with that of the crypts. The cryptic epithelium is modified and inconstant, probably from pressure and debris, as well as the activity of the lymphoid follecules. In close relation to the epithelium, and at regular intervals, are round or oval areas, just large enough to be seen without the aid of a glass, which are different from the surrounding tissue. The borders are deep blue and the centers are a light pink. These are the lymphoid follicles. They are packed with lymphocytes and partly obscured by them. Other cells are present but are not conspicuous.

The crypts are deep, irregular, branched recesses, penetrating the tonsil from its external surface well back to the capsule. It is in these deep crypts that most of the infective processes of the tonsil take place. From inflammation and irritation about the mouths of the crypts they often become sealed off. Then as epithelium, lymphocytes, bacteria and other debris collect, absorption takes place and from these we get the chronic infected tonsil, with the building up of inflammatory tissue.

FUNCTION

The function of the tonsil has been discussed from most every point of view and much has been written to show that, when they are removed, we are taking from the individual a tissue that leaves him in need. A great many theories have been advanced, among many others being the protection theory, the internal secretion theory, the eliminating theory and the immunity theory. Probably the most plausible theory is that of the production of lymphocytes. The tonsil seems to be most active during that period when these cells are most needed. Jordan and Spidel[2] have shown that the rapid growth of limbs in metamorphosing tadpoles is aided by the presence of lymphocytes.

Note the periodic development of the lymphoid ring: (1) The pharyngeal tonsil is present at birth or shortly after and reaches its maturity at the end of the fourth year. (2) The faucial tonsil makes itself evident from this time until the twelfth year. (3) The lateral circular masses of the pharynx and nasopharynx are marked from the thirteenth to the sixteenth year. (4) And last, the lingual tonsil is noted from the eighteenth to the twenty-first year. From twenty-one to old age the lymphoid activity in the throat gradually decreases.

The thymus is considered the predecessor of the tonsil. It is largest at or before birth and, as the tonsil becomes active, the thymus recedes.

The gonads are inactive in early childhood and the thyroid below par, while the pituitary is active and bone growth is rapid during this period. At the same time the tonsil is usually large and active. Again at puberty, nose and throat tissue is turgescent and hypertrophic. It is in this subthyroid state that nose and throat vagotony is most in evidence. In other words, when infections are most dangerous, before immunity has been acquired, observations have been made to prove that the tonsils enlarge to protect the organism therefrom. If the tonsils are removed at an early age, compensatory enlargement of other lymphoid glands takes place.

In surgery of the tonsil we must bear in mind that there are cases where the tonsil left in place is better than its enucleation. Osler[3] says that tonsillar enlargement may be nothing more than a local manifestation of a status lymphaticus. If the tonsils are removed at an early age, compensatory enlargement of lymphoid tissue takes place.

Richardson[4] said that islands of tonsillar tissue, even to large lymphatic nodes, form in the tonsil fossae after well performed tonsillectomies. Smiley[5] found in a group of five thousand Yale students, by a study of twelve thousand colds, that more than one-half of these students had had their tonsils removed. In this latter group no reduction occurred in the frequency of colds. It has been repeatedly observed that young patients, whose tonsils have been removed, have more enlarged cervical glands during and following a cold than do those who have not had a tonsillectomy.

In Kaiser's[6] series of an available group of fifty thousand school children, ten thousand of these were selected for tonsillectomy. All were examined by trained diagnosticians. All tonsils were removed by competent laryngologists and rigid aftercare was given. The definitely hypertrophied tonsils of five thousand of this group constituted 73 per cent of the entire number. The results of operation where hypertrophy was the only symptom showed no marked change. Of the five thousand children who had their tonsils removed, but had previously no cervical enlargement, 22 per cent had definite enlargement ane year later. These are studies that one should call to mind before doing tonsillectomies on all children.

The following case report illustrates this condition. You will note lymphoid tissue surrounded by inflammatory fibrous bands, infiltrated with round cells and covered with mucous membrane. This was a child of six years. Three weeks after tonsillectomy a school nurse looked in his throat and immediately sent a note to the parents that the child should have the tonsils removed. When he reported for examination, one month after tonsillectomy, I found the entire fossa filled with granulation tissue, which when sectioned showed as above. In addition to this, his cervical glands were enlarged more than before tonsillectomy.

PATHOLOGY

The tonsil that harbors a chronic infection is the one which concerns us most in a discussion of this sort. Acute inflammatory processes differ very greatly as to treatment and cure. If uncomplicated, an acute attack of tonsillitis is soon over and the patient back to normal, but as soon as complications arise, the condition falls back into the chronic infected tonsil class.

The faucial tonsil is generally considered one of the main strongholds for focal infection. It probably ranks with the first three, teeth coming first, tonsils second and sinuses third. I have great difficulty every day in my practice to determine if a tonsil shows chronic infection, and still greater difficulty in trying to satisfy myself whether the tonsil is the original seat of a focus from which the patient is absorbing infection.

Out of three hundred and eighty tonsillectomies I have done in the last few years, I have in six of these been most happily surprised to find at operation a definite chronic abscess behind the capsule. I have followed these patients closely so that I might determine whether they made any more satisfactory recovery than did those where no such distinct pathology was found. All of them made immediate, brilliant recoveries but one. This was, a woman aged fifty years, who had in conjunction an intermittent discharging ear on the same side. Her complaint was muscular stiffness, pain and swelling in the joints. The nasopharynx and the ears were treated until there seemed to be no redness in the pharynx and until the ear stopped discharging. She reports now, two years later, that she is feeling well and is carrying on her daily hard work as housewife on the farm.

I shall mention the history in one other of this group, since it will illustrate the difficulty one has in determining from where the infection is coming.

C. J. M., aged 38. His occupation was that of a farmer, a very inteligent, ambitious, progressive man in his community. He came to me complaining of headache in the occiput, general depression, early fatigue, frequent slight colds, postnasal discharge, insomnia, general aches and pains and particularly a dark outlook toward his business and the future in general. He gave a history of having had this trouble for more than eighteen months and gradually getting worse.

He had had his tonsils removed six years before because of frequent acute attacks of tonsillitis. Eight months before coming under my care he had consulted his family physician with the above complaint, who discovered tonsil stumps and who immediately proceeded to remove them with diathermy, using three treatments in all. Following this procedure, he experienced no relief from his symptoms but rather he continued to grow worse.

I examined him carefully, found that he had tonsil stumps, but could not feel that this was the site of the focal infection. I felt that, from the clinical findings and the x-ray film, he was suffering from a chronic, hyperplastic ethmosphenoiditis. Not feeling sure, I referred him to an internist who found nothing wrong and suggested that I find the trouble in the nose and throat. Following my best judgment, I opened the ethmoids and sphenoids.

He made an uneventful recovery from the operation, but his condition did not improve. The nasal operation was performed in February and in June he returned with a tonsillitis on both sides. As soon as the acute symptoms subsided, I removed the tonsil stumps and behind one tonsil was this definite pea green pus, about 1 c.c. in all. He has been perfectly well since.

Many cases of difficulty in making a differential diagnosis between sinusitis and tonsillitis could be cited. In fact, I think we all see them every day. Cultures taken from the surface of the tonsil or from the crypts will tell us nothing. We had as well take a culture from the gums or from the tongue.

Bell[7] reports that from October 1, 1920, to May 1, 1921, seventy patients were cultured, of whom 75 per cent were carriers of hemolytic streptococcus. From May 1 to June 1, 1921, thirty patients were cultured, of whom 56 per cent were carriers. He concluded that the incidence of hemolytic streptococcus decreases very markedly as warm weather approaches. I have repeatedly found this organism in cultures taken from the tonsillar surface and from the mouths of the crypts, and still I could find nothing that convinced me of a focal infection from which the patient was absorbing. I think if fluid pus can be expressed from the crypt or from between the capsule and the tonsil, this is evidence enough for tonsillectomy. Again, if the tonsil is red and accompanied by a red pharynx and nasopharynx, if the pillars are red and injected, and there is a concomitant swelling and edema of the uvula, as well as marked redness of the faucial covering of the tonsil itself, I feel that the patient has chronic infected tonsils.

Cervical glandular enlargement helps very greatly, if the deep anterior group is enlarged, and especially if the tonsil gland just anterior to the sternomastoid muscle is prominent. If all the glands in both triangles are enlarged, I think we should seek further in the throat, the nasopharynx and the sinuses. We will usually be rewarded by finding some other inflammatory process which should be given due consideration, either before or after a tonsillectomy. A history of frequent, definite attacks of acute tonsillitis and peritonsillar abscess also helps to verify the diagnosis.

It is my impression, from a study of my own cases and from the literature, that a chronically infected tonsil is often brought about by a chronic infection of the nasal sinus in adults. Even though there are no afferent lymphatics to the tonsil, topographically this case can readily be seen.

SUMMARY

1. Care should be exercised in diagnosis before removing tonsils in very young children, since there is danger of taking away tissue that is needed in the production of lymphocytes, and hence help to ward off infection and raise immunity which children of today so much need.

2. When tonsils are removed, compensatory lymphatic enlargement takes place, in a large percentage of cases.

3. The clinical diagnosis of chronic infected tonsils should never be made without an examination of the accessory sinuses.

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FISTULA IN ANO *

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Some years ago I heard Dr. Austin of Queens College, Kingston, Canada, talk on the subject of fistula in ano. He said he believed every man who takes up proctology should first have a fistula and be compelled to go through the suffering and the ordeal of surgical treatment so that he might have a feeling of Christian charity and sympathy for his future patients.

He recalled the case of Louis 14th of France, who suffered for years with a distressing fistula in ano, unable to find relief. Every conceivable treatment, simple or horrible, was tried. In despair he ordered that fistula in ano cases from all over France be brought into Paris and doctors who claimed to have remedies for this ailment were bidden to try out their treatment on the fistulæ rounded up. Of course, results were not satisfactory for the methods were far from scientific. Even though some cases enjoyed a slight or temporary improvement, most trials were useless. The doctors, quacks or charlatans who made their patients worse, were flogged or sent to the galleys as impostors. It is a good thing for us that no such custom is now in force.

Finally Louis submitted to the knife with a large court present to witness the operation. A cure was effected and the disease became so fashionable that members of his court all wanted to have fistulæ so that they could be cared for by cutting in imitation of His Majesty and enjoy the distinction of being courageous martyrs. The desire for notoriety prevailed then as now.

I selected this subject not because I have any new discoveries or operations to disclose but because I believe there is a lack of understanding of this very important one. It is a broad and varied one, beyond the limits of this paper to discuss, and as important as it is extensive and varied.

I aim to enter a plea for conservation and prevention and to condemn the slip-shod manner of examinations, and the almost irreparable injury, suffering and damage resulting therefrom. I wish to protest against the sacrifice of health, resulting from poor care after operations, most of which may be successful instead of ending in recurrence and in failure. Modern wound treatment owes its tri-

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umphs to minute attention to every detail of asepsis in the rectal field as well as in others.

Follow me in a few practical suggestions, to which I will give enough consideration to insure, I hope, an understanding of their truth, applicability and usefulness. I will cover sufficient anatomy, upon which to lay a foundation for later remarks.

The anus is three-quarters of an inch long, extends from the skin margin to the dentate border and is lined with transitional epithelium. There are two sphincter muscles, the external which surrounds the anal orifice and contracts the bowel but is in no way intimately connected with it, and the internal, made up of fibers of the circular muscles, which lies around the gut and is closely associated with it. There is a sulcus between the two muscles and in it we find the internal openings of fistulæ. The internal muscle is not always well developed and often is hard to demonstrate, but it must always be considered in dealing with fistulæ.

The rectum extends upward a distance of five to seven inches from the dentate border to the rectosigmoid junction, where the peritoneum is reflected. There is an intimate relation existing between the nerve supply of the rectum, coming from the sacral plexus and sympathetic, and the genitourinary tract. Often a diseased rectum will have the pain reflected to the genitourinary tract.

In the rectum are three or more crescent shaped valves. They are overlapping folds and permit an easy descent of the feces. Between the first valve and dentate border are longitudinal folds of mucous membrane, terminating at the upper limit of the anus, called columns of Morgagni. Between these folds we find the anal crypts, the most important to consider. The lymphatics below the dentate border drain into the inguinal glands and those above it into the hypogastric plexus. In some cases of inguinal adenitis it is well to consider the anus as a possible cause. Remember this fact when dealing with carcinoma of the anus.

Crypts are of much importance to the proctologist because the pathology in them accounts for symptoms often supposed to be of other origin. A large percentage of anorectal infections have their origin in the crypts. Their openings, pointing upward, prevent drainage but collect feces, foreign bodies and a multitude of bacteria in these pockets. Because of the constant physiologic action of the bowel and its accompanying traumatism, the crypts, more than any other anorectal tissue, are subject to infection and inflammatory processes. The lymphatics abound at this level, where the inferior, middle and superior blood supplies anastomose, and by them infection is carried to other tissues and structures.

The infection of the crypts is the cause of ischiorectal, submucous and subtegmentary abscesses, and they in turn are the cause of all fistulæ. From the fact that the openings of fistulæ and abscesses are in the crypts, it is logical to conclude that infection gains admission to tissues involved in inflammatory process at the crypts. This is undoubtedly true in the ischiorectal and retrorectal variety of abscesses.

Cryptitis is the daddy of rectal neurasthenia, producing what we might term rectophobia, with the mental exhaustion, foreboding, fear and introspection which disturbed reflexes give to the victims of anal diseases. Why might not rectal crypts be the foci for rheumatic and arthritic conditions as much as tonsils? Proctologists accept this theory and will tell you that by cleaning up crypts, systemic infection in many cases is removed.

There are two spaces in which fistulæ can be produced, the ischiorectal and the superior pelvirectal. The ischiorectal abscess is below the levator ani muscle and outside the pelvic fascia which covers this muscle and separates this region from the pelvic cavity. The superior pelvirectal space, in which the abscesses form, is above the levator ani muscle, within the true pelvis and closed off from it by the peritoneum.

In considering the subject of fistula in ano we should not forget that it may result from necrosis of the bone, diseased prostate, or any suppuration within the pelvis. Determine, if possible, before operating the course and extent of branching tracts, their depth, etc., as it will aid you in diagnosis and in outlining the type of operation.

The primary cause of fistula in ano is an ischiorectal abscess. The explanation of this fact is anatomic. In the fossa is much loose cellular tissue. The blood supply is poor and sluggish, the lymphatics are abundant and in the canal are pockets and crypts filled with bacteria, and these guests, by slow progress, develop infection and suppuration. You can readily understand how proctitis may be a factor in forming abscesses. They may be deep or superficial, marginal, ischiorectal, perianal and subcutaneous.

The marginal abscess may result from a suppurating, thrombotic hemorrhoid or infection of any of the glands or hair follicles about the anal margin. If these small abscesses are neglected, they may lead to deeper ones and be the cause of fistula.

The subcutaneous variety is explained by its name. It is due to a skin or membrane infection, and is the result of an extension of a marginal abscess. Some cases may result from traumatism and the lymphatics spread the infection to underlying and surrounding tissues.

The ischiorectal variety of abscess occurs in the ischiorectal fossæ, sometimes involving both and surrounding the rectum. I have seen these result from operations for hemorrhoids, due to violence in stretching the sphincter muscles; from ulcers, badly inflamed crypts, or from papillæ, all developing a process of suppuration through the communication of lymphatics. The eye can detect induration and swelling when an abscess is well formed in a degree, depending on the depth of the abscess. By passing the finger into the rectum you can find an indurated circumscribed mass which will diagnose the case.

The resistance of the levator ani muscle above and the obdurator fascia outside has a tendency to make the abscess extend downward and, if not incised, there will soon be bulging at the side of the anus. After diagnosing an abscess, lose no time in using the knife. Never use hot applications nor wait for fluctuation. Do not be afraid to cut extensively and bevel off the edges of the wound to insure a wide opening that can not bridge over and form a fistula. A small opening is of no value because contraction of these wounds about the anus takes place rapidly. *Always make the incision larger than the indurated area.* A crucial incision will generally assure better results than a straight line incision. A free incision aids nature in removing resistance overlying the pathologic field.

Make the incision in an anteroposterior line, well away from the sphincter for the contracting anus has a tendency to separate the margins of the wound and favors free drainage. After the abscess is opened the finger should be introduced to break up any pockets and to remove any necrosed tissue. I generally swab the cavity with equal parts of iodine and carbolic acid. If there be much hemorrhage, pack the cavity with gauze wrung out of hot water.

After the first twenty-four hours place the gauze packing lightly so as not to interfere with drainage. Some men favor the use of irrigation but you get more rapid results without it. Balsam of Peru and castor oil (of each, one-half) stimulate granulation. If both fossæ are involved, incise between cocyx and anus and extend the incision to both sides. This gives free access to the cavities.

If, on opening an abscess in the anal region, fecal matter be found, it is evidence that the cavity communicates with the rectum but fecal odor does not necessarily mean that an opening exists. It is often the odor of decomposition and liberated gases. If you find fecal matter in the abscess, proceed as in a fistula case; don't trust to Providence in these cases. Insist upon perfect cleanliness and asepsis in the aftercare. I have given much time to abscesses for the reason that a large percentage of all fistulæ are caused by them. I base all that I say on fistulæ on this hypothesis.

While you hope to prevent a fistula by treatment of an abscess, bear in mind that any abscess of the ischiorectal space, even with the best surgical care, may result in fistula. These abscesses show colon bacilli, streptococci or staphylococci. The bacillus of infleunza or the gonococcus may be present in some cases.

Most of the pathology of the anus lies below the dentate border and levator ani muscles. Subjective symptoms of pathologic processes in this region bear but little relation to the lesion itself but result from interference with the functions of the nerve supply of tissues involved.

In some few cases of abscesses the tubercle bacillus can be demonstrated but the fact is that few tuberculous patients develop abscesses and fistulae. Due to the poorly nourished fat in the fossae, the process is a very rapid one and burrowing takes place with great rapidity in the line of least resistance, forming, if not promptly cared for surgically, fistulae of every variety. If the pus from one fossa passes under the anococcygeal ligament, the other fossa is rapidly involved and you get as a result the horse-shoe fistula. A pus tube or broad ligament abscess may encroach on the rectal space and by perforating the levator ani muscle develop an ischiorectal abscess.

The degree of pain due to the anorectal disease, except in acute inflammations, is proportionate to the amount of sphincter spasm induced by the pathology. Hence the reason for cutting the sphincter to give rest to the parts and freedom from pain. The result of operation for these abscesses depends as much on aftercare as on the technic of the operation.

Fistula in ano is a very important subject, for in no pathologic condition will improper surgical care arouse more little devils and demons. A point always to remember when making examinations of the anal region is that a tight sphincter indicates disease or irritation in the last inch of the rectum, showing cryptitis, papillitis, fissure pockets, fistulæ or proctitis. A very weak sphincter usually points to higher up trouble. A reckless neglect of proctitis, cryptitis, papillitis or other trouble in the anal ring ends in despair and often the necessity of holes being bored by pus seeking an outlet. Pus follows the path of least resistance. It may take indefinite periods of time before a communication with the external surface of the anatomy is completed. The development of a fistula gives rise to distressing symptoms before finding an outlet. We have myalgia, pain at the end of the spine and distressing reflexes. Do not let the coccyx be removed by the ever-ready surgeon for this pain at the point of the spine. You might as well remove the muscles for myalgia.

We are called on so often to answer the question, "Why should I have such a nasty disease?" There is one answer that will cover most cases, —neglect. Not always the neglect of ignorance on the part of the patient, but it is too often the neglect of the doctor consulted who does not thoroughly and scientifically prevent the disease by early and correct diagnosis.

Mistakes are so often made because surgeons dislike the instructive lesson learned from passing the gloved finger into the rectum. The same doctor will be punctilious in heart examinations or in lavaging the stomach for gastric diagnosis. How often the sufferer is dismissed with a prescription for piles without the doctor ever having taken the trouble to know if he has them.

Regardless of what the patient may tell you, inspect and examine all cases for yourself, and in doing so not only use the finger and anascope, but the proctoscope. The genupectoral position is the most practical one for easy and thorough examination. I use the Haynes chair and find it comfortable for the patient and it makes the work easy. Be very careful in passing probes lest you make a false passage or tract in sound tissue which can carry the infection further.

Use the index finger to learn whether the sphincters are spastic and to search for indurations or possibly the opening of a fistula. The finger with its delicate sense of touch and almost sight, the x-ray of Deaver, will alone many times reveal what is lurking in the dark recesses of the anal canal and rectum. If you don't put your finger in the rectum, you will sooner or later put your foot in it.

I will call your attention to a little point in anal diagnosis which will serve well in making a differential diagnosis and save time in exploring for, perhaps, a blind fistula. If the patient complains of pain after stools, lasting for half an hour or more, you can in most cases diagnose a fissure before an examination is made. The anus will be retracted, the sphincter spastic, and the examination causes sharp pain. Have the patient strain to aid in everting the anus gently and the fissure will come into view either anteriorly or posteriorly. Use cocaine on the fissure so that you can pass the gloved finger without causing pain.

Associated with all chronic fissures is a posterior skin tag called a sentinel pile and inside and above the fissure will be an enlarged papilla. This is what Hirschman and Buie call "the anal trinity."

The subcutaneous type of fistula is easily curable by laying the tract open and getting rid of the granulations which line it. Fistulae resulting from ischiorectal abscesses differ in variety and extent, and may ramify over a large field often many inches in length, with many points at which pus burrows to the surface. In complete fistula we generally find the external opening an inch to one and a half inches from the anus, showing as a raised, pink pimple, with the internal opening inside the anal margin and often difficult to locate. The tract of this type of fistula runs between the external and internal sphincters but is not always a straight line, often being a large curve.

The opening of a fistula is most generally found in a crypt. These lie posteriorly and just below the dentate border. Always search the crypts and not the rectal walls. If you should perchance find an opening in the rectal walls, it is rare and might be the result of an opening made by the probe in making examinations. To aid in diagnosis and to save much trouble, draw a line between the tuberosities of the ischia. The fistulous tract anterior to this line generally is a straight line between the internal and external openings and it is a simple matter to pass a probe, along which the incision is easily made.

Posterior to this line the tract is often ramifying but more often the internal opening is right in the midline posteriorly, and here, again, it is a small postanal pocket or crpyt. Look for the external opening to the side of the middle line. Sometimes the exit of a fistula will be so swollen and full of granulation tissue, as to look very much like an eroded thrombotic pile but a careful study of the point of discharge and the use of fine flexible probes will prevent a mistake in diagnosis.

Posterior fistulae follow the outline of the rectum, giving us what is known as a semihorse-shoe fistula. The external openings do not indicate or suggest in any way the long tortuous branches which may exist. Even though you may not find the internal opening, if an intelligent patient tells you that flatus passes through, do not overlook the almost certainty of an existing opening. Do not put the finger in the bowel when attempting to probe, for it will excite a spastic condition of the sphincter and throw the tract out of line.

If you find a lot of ramifying tracts in the fat of the ischiorectal fossa, with a large opening in the rectum almost admitting the finger, the skin over the tract undermined, a sanious discharge and the general condition of the patient suggestive, you have a tuberculous fistula. Years ago it was believed that a large percentage of fistulae were tuberculous and should not be operated upon, but since correct tabulations are being made we have discarded the theory, for we know that only from three to ten per cent of the cases ever prove to be tuberculous. You can not be sure of the diagnosis until the tract is opened or the base findings submitted to microscopic examination and study. More men than women have fistulae. I am willing to let some of you pathologists tell why, for I am sure I do not know.

We may classify fistulae as complete, incomplete, blind, horse-shoe, water-pot, simple and complicated. An abnormal channel in the tissues of the body can be considered a fistula. Anal fistulae involve the tissues above the mucocutaneous line. A complete fistula is one that has an internal and external opening. An incomplete fistula is one which opens only on one surface. A blind external fistula is one which opens on the outside of the anus and is incomplete. A blind internal fistula is an incomplete one opening in the anal ring.

If you can pass a probe or small silver wire from the external opening through the internal opening, then insert a piece of gauze in the anal canal and inject with methylene blue. On withdrawal of the gauze you will observe a blue stain and its location will aid you to find the internal opening. To make a cure you must find the internal opening.

Pass a grooved director and lay the tract wide open from the external to the internal opening. Bevel the edges widely so as to convert the wound into a ditch, changing a tunnel to a ditch. If there be any branching tracts, follow them and lay them wide open and bevel the edges. Make them communicate with the primary incision.

Care should be observed to properly prepare a patient by cleansing the tract and field as far as possible under the circumstances. Let me note here that dirty diapers as a cause of proctitis often lead to abscesses or fistulae in after years.

There are four methods of operating: (1) Injection of the sinus, (2) the silk ligature, (3) the elastic ligature, (4) the knife.

In operating upon a recent fistula, where no induration of the tissues exists, I have no doubt but that sometimes good can be accomplished by injection of nitrate of silver, iodine, etc., but I would not use this method in my own practice. To say that the adoption of this treatment in fistula in ano is advisable is folly. Irritation sufficient to close the external opening might be excited but this is just what is not wanted.

The silk ligature is used by some men and is useful in handling an uncomplicated case, if the patient dreads the use of the knife. The one advantage is that the patient can remain out of bed. If only one sinus exists and it is a recent one, a cure can be effected. If the disease has existed a long time the silk ligature will be ineffectual.

The elastic ligature produces more pain than the silk ligature in most instances. It does away with the horror of the knife; it is not attended by hemorrhage; it can be introduced without an anesthetic, and the patient can usually go about during the treatment. The disadvantages are: If the sinus is callous, it will not cure the disease; if it is drawn too tightly, the pain is great. It delays the cure for it takes from eight to twenty days to cut through. If the disease has existed for any length of time its use is contraindicated.

The knife should be preferred to all methods in most cases. No surgeon should succumb to the whims of a patient if it violates his judgment. The great majority of cases are not seen until they have existed for some time

Do not dilate the anus as is so customary. With the use of sacral anesthesia it is not necessary, for this gives complete relaxation and full view of the field for operation. I use this form of anesthesia almost entirely and have not yet had any bad results.

To easily find the entrance to the caudal canal, search for a fontanelle-like depression and by introducing the needle through it you have no difficulty in entering the canal. After the needle is introduced withdraw the piston of the syringe to be sure that you have not entered the dura. If you should have the misfortune to do this, a bloody fluid would be drawn into the syringe and you would have to wait a while before you continued the injections.

Use from thirty to fifty c.c. of a one per cent solution of novocaine, to which has been added three or four minims of adrenalin. Inject the sacral nerves through the foramina, using five to eight c.c. in each. In fifteen minutes the patient is ready for any operation about the rectum. Have anesthetic nurse note blood pressure and pulse. If a depressed feeling overcomes the patient, apply an ice-cold towel to the face. At the same time lower his head a little. The patient lies on a cushion, placed under the hips, face down.

The laity have the impression that you cut out a fistula. There is more good surgery than poetry in the idea. The more you cut these patients the better they do. If you find a very callous tract you need not hesitate to cut it out. I condemn, however, the idea of dissecting out the tract, except in very simple cases, and then sewing up the wound. You scarcely ever get union by first intention and the wound most always becomes infected and the necessity of laying it open deeply occurs.

In operating, lay the main tract wide open its entire length. Incise varying branches freely through the skin to give free drainage, so essential in this work. Be careful, in searching in fistulae for ramifications and branches, not to push the probe into the healthy tissue, thereby making a channel where none existed. Never cut the internal sphincter muscle unless a grave condition, which seldom exists, requires one to take the chance on incontinence.

If, after dividing the external sphincter muscle, you find internal hemorrhoids, you need not hesitate to remove them. If you do not, they may become larger after the relaxation from the cut sphincter and they may crowd into the cut and interfere with healing. Before operating be sure that the bowel has been properly prepared so that no fecal matter can flow over the wound and infect it.

After satisfying yourself that you have reached any branching tracts, leave the wound wide open and pack lightly with gauze. Never pack tightly unless it be necessary to control hemorrhage. Use sterile vaseline on the gauze.

If there be two or more openings, cut the sphincter muscle but once and always at right angles and do a secondary operation after the first one has healed. Never make the mistake of cutting the sphincter obliquely, for it will surely result in incontinence. If it should occur, do a subsequent operation by dissecting out the ends of the muscle and uniting with buried sutures of chromic gut. If there is complete incontinence and it is impossible to restore the muscles, bring the levator muscles together and attach to the anal ring, and you will secure a result which will give partial sphincter action, saving the patient great discomfort for you will have provided a considerable degree of control.

An uncomplicated fistula usually makes a good and rapid recovery but to forecast the termination of a complicated one is a serious problem. Free incision, good drainage, prevention of absorption of septic matter, thorough asepsis, perfect cleanliness, frequent changing of dressings are points to be observed. I will change Deaver's advice, "cut well, sew well and get well" to read, "cut well, drain well and get well."

The key note to success is to keep the wound absolutely clean. As a routine treatment I use five per cent solution of diachloramine in chlorazine oil as an application to the open tracts. For the first few days following the operation change the dressings every few hours and use hot fomentations. This is gratifying to the patient for it makes him more comfortable. The bowel should be moved after three days. Use a light aperient and inject a few ounces of oil into the rectum. Do not use drugs to tie up the bowels. It is not necessary. Tell your patient not to allow a bowel movement for three days and his will power always controls the situation. A hypodermic injection of morphine may be necessary during the first twenty-four hours but seldom afterward.

I believe that failure to heal is due to neglect, improper treatment after operation. It will usually require four to six weeks before healing of a complicated fistula is possible and you may have some cases under your care a much longer time. Be painstaking and patient and you will be gratified in most cases by a good recovery.

Medical and Dental Building.

EPILEPSY OF LONG STANDING

CURED BY SYMPTOMATIC TREATMENT

REPORT OF A CASE

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The many articles appearing in our literature on the subject of epilepsy reveal very clearly the limited number of proven facts concerning this dread disease and serve to emphasize the paucity of our knowledge as to cause and treatment. Much has been said as to the value of starvation in treating certain cases. Goldbloom reports the treatment of epileptic children at the Children's Memorial Hospital, Montreal. Water and clear broth were the only foods given for several days at a time. Uniform improvement followed and, when this treatment was repeated at intervals of ten days or two weeks, seizures were much less frequent and in some instances did not reappear until patient left the hospital. Goldbloom holds that this line of treatment is of value in diagnosing cases of intestinal origin.

Weeks reports experiments on sixty-four patients in the State Village for Epileptics in New Jersey. Various special diets and starvation periods failed to produce any uniform improvement. In thirty of his sixty-four cases there was some improvement temporarily, but in every case the disease resumed its normal course when experiments were concluded.

It is probable that epilepsy is a disease due to many causes. Regardless of the cause, we have the patient to treat. His condition is so pitiable, his outlook so dark and his prospects in life so hampered that anything the physician can do to lighten his burden should be done. A careful study of all physical defects, including foci of infection, endocrine deficiencies, pelvic deformities or gastrointestinal abnormalities should be made and as far as possible corrected.

I wish to report a case successfully treated, following this course.

Case No. C-876. Mrs. C. H., farmer's wife, age 42 years. Mother of six children. Works hard under rather difficult economic conditions.

Family history. Father living and well. Mother has been dead many years, father married second time and has several children, the youngest of whom is an epileptic, is foolish and blind, microcephalic with very small and undeveloped eyes. The remaining brothers and sisters are normal. Mother was not an epileptic.

Personal history. Patient was a normal child, born without the use of instruments. Had the usual childhood diseases. Smallpox at the age of 19 years. No other serious illness. Remained well except that she always had a great deal of pain and discomfort at menstrual periods, accompanied by weakness and faintness.

Soon after the delivery of her fourth child, at the age of 32, she began having epileptic seizures. She associates the beginning of these attacks with a fall she had when she tripped on a wagon tongue and fell over backwards, striking her head on the ground. Attacks are typical of grand mal; have increased in frequency and severity until in 1923, when they were coming about once a month. Patient would be in an unconscious or semiconscious condition for twenty-four hours at a time. During this period she would have as many as twelve convulsive attacks.

In 1917 she was operated upon and the appendix and right ovary removed. She does not know the condition of the parts removed. Following this operation, her epileptic seizures continued with increased severity until 1923, when she came under the writer's observation. At that time she was very dull and apathetic, slow in every movement and every thought, very deliberate in her answers to questions and very slow to understand. Her home was neglected, children not cared for and despair brooded over the home.

The usual bromide treatment was started. Meat and eggs were prohibited and a vegetable diet insisted upon. A radiogram of her skull showed a moderate degree of deformity of the sella tursica, especially the posterior portion, which extended upward and backward farther than usual. There was a well marked polyuria, as much as seven pints per twenty-four hours being reported at various times. No sugar was found in the urine. Specific gravity was always low but casts and albumin were not present.

Because of the polyuria, the deformed sella and the general lethargy, tenth grain doses of desiccated whole pituitary and one grain doses of thyroid were given three times a day. Both the patient and her family were cooperative so that instructions were well carried out. The epileptic seizures gradually became less frequent and her last convulsion occurred in July, 1924. Headaches continued and the painful menstruation, soreness and tenderness in the pelvis persisted.

In September, 1925, she submitted to another abdominal operation. The uterus was retroverted and adherent in the pelvis. The left ovary was hard, fibrous and cystic. The tubes showed a low grade chronic salpingitis. The round ligaments were shortened, left ovary and both tubes were removed. A fairly rapid recovery was made from the operation.

At the present time, one and a half years after operation and three years after the last convulsive seizure, this patient presents a very different picture. She is bright and intelligent in conversation takes an interest in her surroundings, is a good housekeeper and a joy to her family.

SUMMARY

The fact that this patient was relieved of her epileptic seizures for a year and a half by dietetic and glandular treatment would indicate that the pelvic condition was not the cause of her epilepsy. However, the improvement in her general health, relief from headaches and improved mental condition following operation would indicate that the pelvic condition may have been an important factor in producing nervous instability.

This case emphasizes the importance of treating the patient in each individual case rather than the disease.

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EDITORIAL

THE DEFECTIVE AUTOMOBILE DRIVER

The mortality from automobile accidents in this country has reached such an appalling figure that there is a constant and wide-spread demand for some sort of action to be taken that will check its continuance. Many suggestions have been offered and laws have been enacted to protect the public from the death-dealing automobile. As yet, however, marked results do not seem to have followed these efforts. While there are doubtless many collisions and fatalities, for which the drivers of automobiles are in no manner at fault, yet responsibility for the great majority can be placed on the man at the wheel. In a large proportion of cases irresponsibility of youth or the ingestion of alcohol is discovered as the primary fault. Recently two youths drove wildly about city streets, finally dashing into a group of high school students awaiting a street car. Two of the latter were killed and others seriously maimed. The perpetrators of this outrage claimed they were under the influence of liquor and partially stupefied from the effects of barbital.

Little attention has been directed toward deficient eyesight as a cause for automobile accidents. Who knows how many drivers on our streets are color-blind, unable to distinguish the red from the green signal lights. Instances have been known of active railroad engineers and street car motormen with color-blindness which in some manner had escaped observation. One is appalled at the contemplation of possible tragedies at the hands of such individuals. The likelihood of similar catastrophies from automobile drivers with this defect is more than an idle dream. In every city men are driving automobiles whose vision is so defective that they barely escape the classification as blind men. There is no way of detecting the individuals herein discussed, unless they be subjected to physical examinations. Why should not drivers of automobiles be required to take such an examination before being licensed to drive a machine? The conservation of life would seem to demand this as much as the requirement for drivers of other sorts of engines which provide motive power for conveyance of human beings.

Probably it would be considered too radical to demand that the mental qualifications of drivers of automobiles should also be ascertained. If the morons and individuals with lesser mental capacities were excluded from the driver class, there would be an immense reduction of accidents. This ideal may be the subject of future legislative consideration. If presented in any feasible form, it would undoubtedly meet with universal approval and support.

MOTHER INDIA AND AN ANSWER

A few months ago "Mother India," a book written by Miss Katherine Mayo, burst upon public notice and for a time occupied the center of the stage with the limelight of interest focused on it. Even today it is within the glare, though other more recent books have crowded it toward the edge of the spot and away from the center to which from time to time it returns. The author described a relatively brief visit in India, during which she accumulated an enormous amount of information which she presented in a vigorous, forceful and at least temporarily convincing style. She detailed conditions alleged to be widely prevalent in a manner that was conclusive to most of her readers, many of whom were fascinated, shocked, horrified and made indignant at the existence of a seemingly intolerable state of affairs that was an affront to civilization, portraying the people of great, though unfortunate India as almost beyond the pale in every question touching upon morality.

She wrote chapters of intense interest to physicians, sociologists and readers generally, describing terrifying conditions of child marriage, of child birth supervised by unspeakably filthy midwives, of suttee (the burning of widows), of all but unbelievably widespread venereal disease, of universal sex debauchery and perversion, of brutality alike to women and animals. She wrote with dogmatic assurance of certainty that brooked no contradiction. The writer read part of her book and accepted it as probably based on gospel truth but after a time seemed to sense something unconvincing and savoring not a little of old-fashioned muckraking with perhaps a touch of fanaticism. Hundreds of thousands of Americans who read the book were indignant that such sordid conditions as described could exist but only rarely was the voice of the doubter and skeptic raised in faint protest of unbelief.

Now comes "A Son of Mother India Answers," in which Dhan Gopel Mukerji analyzes Mother India and convicts Miss Mayo out of her own scrivenings of making unwarranted generalizations and distortions of the truth and, less convincingly, of propagandist tendencies. His arguments are in the main temperately worded and well balanced. He shows how she states as absolute fact much that is clearly but hearsay evidence, such as would not even momentarily be tolerated in a court of justice. He cites numerous extracts from her book in which she quotes anonymous authorities or those who have long since died. "In the entire book," notes Mukerji, "most of the serious charges were made by people who are dead or, if living, their names are not generally given." He invites Miss Mayo to print names and addresses, assuring her that she owes it to public decency to reveal the exact sources of her knowledge which otherwise he very properly thinks may be dismissed as untrustworthy.

In Mother India it is a fact that the author makes such vague and unconvincing allusions as that "trained American observers," "one of the most eminent living Indians," etc., have made certain observations, but in many cases she does not name her authorities. After reading Mukerji one feels that this book must be taken with more than a grain of salt. The author seems to be somewhat of a propagandist and an extremist who substitutes her own opinions and conclusions for exact fact. One is reminded of the extraordinary enthusiasm which a few years ago was roused in reformers by the activities of various social hygiene societies, where the difficulty was, not to get information regarding social evil, but to state it temperately, prevent gross exaggerations and keep out personal and religious propaganda.

Those who read Mother India, accepting it as unalloyed truth, will do well to take the antidote prepared by Mukerji. The dose is small, a booklet of but one hundred pages with a short appendix, which can be read in an hour or two. But it is as potent as an alkaloidal pill, administered to overcome the effects of too much undigestible food. NORTHWEST MEDICINE discusses this problem because Miss Mayo's book excited widespread interest among doctors. It contains much information that even Mukerji admits is based on fact but, if he is correct, it also presents unjustifiable exaggerations which will seriously harm the cause of India. Doctors should read both sides of the question.

OUR HOSPITALS

The Hospital Number of the March 24 issue of the *Journal of the American Medical Association* presents the first edition of the "American Medical Association Register." Herein is accumulated a mass of information regarding hospitals of the United States, the data of which have been verified during recent months. Some facts concerning hospitals in our three states of the Pacific Northwest will be of interest. The hospitals under consideration include only those which have been admitted to the Hospital Register. Certain unethical and for other reasons undesirable institutions have been excluded from these lists.

In Washington there are 129 hospitals, containing 14,812 beds. Of these 35 are government owned (federal, state, county, city); 94 are nongovernment institutions (church, fraternal, industrial, individual, independent). In Oregon there are 93 hospitals with 8,699 beds. These include 19 government and 74 nongovernment institutions. In Idaho the total is 57 hospitals with 2,906 beds, being divided into 16 government and 41 nongovernment institutions. Further data give the number of hospitals coming under each subdivision, showing the auspices under which each functions. The hospitals of each state are listed under their separate cities, specifying the character of each hospital, its number of beds, the existence of nurses' training schools and the sorts of superintendents. Thus we learn that Portland has 30 hospitals, Seattle 21, Boise 7, the above mentioned statistics being enumerated for each of them. Standardized hospitals, approved by the American College of Surgeons, are indicated also, as well as those providing for intern training and others approved for training in specialties.

It is interesting to note that there are 462 unregistered hospitals, nearly half of which are in charge of medical doctors, most of whom are licensed in their respective states. The record shows that 11 of these are in Washington, 7 in Oregon, 3 in Idaho. The reasons for their exclusion are numerous, such as control by imposters or unethical individuals, exploitation of fads or quack cures, criminal or other unethical practices, etc. The names of these institutions are not published. The thought occurs that such publicity might be a most effectual method of their suppression.

Every physician is interested in the character and standing of the hospitals in his community. Therefore, he will find much of interest in this report. It is well known that the supply of hospital facilities is inadequate in most states. Any effort that gives publicity to facts pertaining to hospitals will elicit public interest which will probably foster a spirit of cooperation, and may aid in securing the support necessary for their increase and maintainance.

A WASHINGTON MEDICAL SCHOOL

For many years there has been agitation at times concerning the establishment of a medical department at the University of Washington. The inauguration of such an institution has been earnestly advocated on several occasions by certain individuals. It has never been greeted with favor, however, by leading members of the medical profession of the state, who have not considered the time opportune nor the demand urgent for launching such an enterprise. Recently the matter has been revived and some preliminary action undertaken. It has been rumored that certain responsible interests had been enlisted to consider establishment of such a school, the argument being that all the best medical schools are now limiting the number of their students and it is becoming increasingly difficult for one to obtain entrance to the medical school where he desires to pursue his studies. Some believe there is a demand for more medical teaching facilities, which is adequate grounds for seriously contemplating the inauguration of such a school in Washington.

At the recent annual dinner of King County Medical Society, President Spencer of the University of Washington officially discussed this problem, stating that his views are endorsed by the Board of Regents. He believes that a medical institution should not be established in connection with the University until sufficient funds are available to construct and maintain a school of the highest standards. He places $10,000,000 as the sum which will be necessary to accomplish this purpose. There is no reason to expect that the state will have such funds at its command for this purpose for a long period of years. If individuals with large visions of public service should be inspired to provide such necessary funds, the whole matter would present a different aspect. At present, however, no suggestion of this sort has been offered from any source. It seems, therefore, that this medical school agitation can safely be put to rest for an indefinite future period.

THE AMERICAN COLLEGE OF PHYSICIANS MEETING

The recent meeting of the American College of Physicians at New Orleans was so well attended and its members so enthusiastic that it is very evident this organization has made long strides forward. The actual registration was nine hundred and twenty-seven, but there were over fifteen hundred physicians in attendance at the sessions when visitors were included.

The leading speaker was Professor Julius Bauer of Vienna, Austria. Other important papers were given by Rowntree, Sailer, Allen Krause, Pottenger, Dochez, Bassler and Frederick M. Allen. Of great interest was the symposium on tropical medicine, presented by Argamonte, Colonel Roger Brooke of the United States Army, Castellani, William James of Panama, Canal Zone, and Eugene R. Whitmore of Washington, D. C. Maude Sly presented her work on heredity in cancer and was enthusiastically received.

Politically the organization has somewhat changed its complexion on the Board of Regents, the number of men from the far East being greatly increased in number. Dr. Charles Martin, Dean of McGill, took the gavel for the ensuing year. Dr. John Herr Musser of New Orleans was made President-elect. Dr. George Morris Piersol was reelected as Secretary-General. The newly elected regents are Sydney R. Miller of Baltimore, William Gerry Morgan of Washington, D. C., James H. Means of Boston, J. Alexander Miller of New York, John Phillips of Cleveland, and James S. McLester of Birmingham, Alabama.

Dr. Frank Smithies was given an ovation on the presentation of his retiring address. The next meeting place has not yet been decided upon, but invitations were received from Montreal, Boston and Cincinnati.

VALE, CHIROPRACTIC

That chiropractic should have gone on the rocks was inevitable. Sooner or later the same fate will await all of the medical cults which exist as short cuts to the practice of medicine. In a recent Philadelphia address, to a group of his followers and dupes, B. J. Palmer, the originator and high priest of the chiropractic cult, sang his own swan song, announcing that he was done with this form of practice and thenceforth the thousands of chiropractors whom he had fostered and launched on their careers, will be forced to shift for themselves without the support of their great leader and prophet. His explanation has been obvious from the outset to anyone of ordinary intellect. These cultists, whom he has developed and instructed along a single line of treatment, soon found this narrow gauge course inadequate and, as the peerless leader has stated, they ventured the attempt to practice medicine en masse. He attributes the debacle to the passage of the basic science laws, inspired largely by their existence. States having this means of discriminating between knowledge and ignorance have thus barred their entrance for practice. He states, furthermore, that the supreme courts in seven states have handed down injunctions whereby they are lost forever to chiropractic. The only sop which he offers to the mourners is that by suitable education they may yet be enabled to enter the ranks of medical practitioners. Personally he is not concerned. Having amassed a fortune by commercializing on a grand scale his own medical "discovery," he does not propose to waste more money in an attempt to bolster a hopeless cause, and forthwith proclaims he has quit. Thus ends this bizarre excursion in treatment of human ailments which within recent years has attracted quite an army of followers. Vale, chiropractic!

IDAHO, ATTENTION!

Idaho all bucked up. Over what? Having the Montana boys with us at the Yellowstone Park meeting next August. By "us" we mean Wyoming and Idaho, with Montana. The tri-state meeting will begin August 27 at Canyon Hotel in Yellowstone Park. Idaho State Medical Association now feels that the success of this meeting is assured, and that it cannot help being one of the greatest meeting of its kind ever staged in the West. The Idaho association wishes the Montana bunch to know it is a real pleasure to have their state association join with Wyoming and Idaho in this combined annual meeting.

NEW ADVERTISEMENTS

Attention is called to the following new advertisements, appearing in this and last month's issues: Washington Postgraduate Medical Lectures (page 18) are presented with details of the full program. Vancouver Medical Association (page 34) lists its faculty for the summer school. University of Bordeaux (page 27) has a special postgraduate course. Hollister-Stier Laboratories (page 17) feature their hay fever pollens. Kentucky State Board of Health (page 27) provides laboratory and physiotherapy technicians. Northern Pacific Railway (page 9) offers its route to the A. M. A. meeting at Minneapolis.

MEDICAL NOTES

OREGON

Pacific Coast Surgical Association held its annual convention at Portland and Gearhart Feb. 22-25. The first two days were devoted to surgical clinics in several Portland hospitals. Those in attendance were then conveyed to Gearhart, where a scientific program occupied the remaining time of the convention. Among the papers presented were "The Early Recognition and Treatment of Cancer," by Dr. Fred Fairchild, Woodland, Calif.; "The Mechanism and Treatment of Intestinal Diseases," by Dr. Park Weed Willis, Seattle, Wash.; "Gallbladder Diseases," by Dr. F. A. Lobingier, Los Angeles. Golf and a banquet at the close of the session were features provided for the entertainment of the guests.

New officers of the association were elected as follows: President, Dr. F. A. Lobingier, Los Angeles, Calif., first vice-president, Dr. George W. Swift, Seattle, Wash.; second vice-president, Dr. A. A. Matthews, Spokane, Wash.; secretary-treasurer, Dr. E. L. Gilcrest, San Francisco, Calif. The 1929 convention will be held at Catalina Island, Calif.

Aid for Clinic Anticipated. Dr. Richard B. Dillehunt, Dean of the University of Oregon Medical School, Portland, recently returned from New York City, where he made an appeal before the Rockefeller Foundation for aid in enlarging the facilities of the medical school out-patient department. He stated his petition received favorable attention and that a grant from the foundation will depend largely upon the success of local efforts to place the permanent maintenance of the clinic on a firm financial basis. It is estimated that approximately $400,000 is needed to erect and properly equip a new clinic building. The site of choice is the new medical center on Marquam hill.

Annual Lectures Delivered. The sixth Noble Wiley Jones lectures were held at the University of Oregon Medical School, Portland, March 21-22. Dr. Julius Bauer of Vienna, Austria, privatdozent in internal medicine at the University of Vienna and physician-in-chief to the Polyclinic Hospital, was the lecturer. His first address was upon the subject of "Individual Constitution in Clinical Pathology." On the second evening he discussed "New Aspects in the Treatment of Obesity."

Portland Invites American Medical Association. Dr. Joseph A. Pettit, Portland, has recently returned from Chicago, where he presented to the board of trustees of the American Medical Association Portland's official invitation to the national body to hold its 1929 convention in that city. The invitation was sponsored by Governor Patterson, Mayor Baker, the Oregon State Medical Society and the Portland City and County Medical Society. It will be acted upon at the Minneapolis session next June.

Investigators Condemn Tuberculosis "Cure." At the close of seven public sessions, in which testimony was taken from witnesses for and against Geo. A. Kirkpatrick's alleged tuberculosis remedy, "Pul-Bro-

Tu," the special committee, appointed by Mayor Baker of Portland to investigate the merits of the preparation, submitted its official report on March 10. The report, which was addressed to Mayor Baker, was as follows: "Your committee, appointed by the mayor to investigate a secret preparation manufactured by Dr. Geo. A. Kirkpatrick, veterinarian and chiropractor of this city, and sold by the Kirkpatrick Company, Inc., under the name of Pul-Bro-Tu, find after full consideration of the statements, written and oral, that this preparation is without value in the treatment of tuberculosis and its cure as such constitutes a menace." The sessions were stormy and marked by frequent charges and counter charges. Following the verdict of the committee, George I. Steel of the Kirkpatrick Remedies Company announced that for the present the preparation would not be offered for public sale.

Banquet Honors Physician. Dr. Andrew A. Price, one of Portland's most active pioneer physicians, was honored at a banquet given by his colleagues at the Heathman Hotel Feb. 29. Dr. A. E. McKay acted as toastmaster. Dr. Price has been in active practice in Portland since 1888. He has served terms as vice-president of the American Medical Association, as president of the Oregon State Medical Society and as a member of the state legislature during three terms. He has been given the credit of having performed the first goiter operation in this region.

Cancer Clinic Opened. The cancer clinic, recently announced by the Good Samaritan Hospital, Portland, was opened to the public March 12. Services include both diagnosis and treatment, which are rendered gratuitously or on part-pay plan, according to the circumstances of the patient. Special attention is to be paid to the earliest possible methods of detection of malignant disease. A Portland business man has endowed a free bed in the hospital for the use of the new department.

Clinic to Build. Drs. Bodine and Cantrill of Portland have announced plans for the early construction of a new $75,000 building, which is to house their clinic.

Doctor Seriously Burned. Dr. Vernon J. Brown of Portland suffered severe burns of his face and arms March 3, when he attempted to carry out a gasoline stove which had exploded in his beach cottage at Ocean Lake.

New Health Officer Arrives. Dr. D. Payne, who has been appointed to the position of county health officer of Douglas County, to succeed Dr. Laraway, resigned, has moved to Roseburg and entered upon his new duties. For the past eighteen months Dr. Payne was connected with the department of health of the city of Los Angeles, Calif., at its municipal tuberculosis sanatorium at Olive View.

Lane County Medical Society held a joint meeting with the Southern Willamette Dental Society at Eugene March 17. Dr. Gunn of Corvallis, president of the Dental Society, acted as chairman. The scientific program consisted of a symposium on "Focal Infection," which was participated in by Drs. I. R. Fox, Leslie Kent, W. H. Dale and A. H. Ross.

Central Willamette Medical Society held a meeting at Eugene March 1. Dr. Otis Akin of Portland presented a paper dealing with injuries of the back. Dr. Hugh Mount, president of the Oregon State Medical Society, was a guest of the society and made an address.

Dr. DeWitt C. Burkes, who has had extensive service in mental and nervous institutional work, has located in Portland, where he will be associated with Dr. William House in the practice of neuropsychiatry.

Dr. W. E. Nichol, a graduate of the University of Oregon Medical School and a recent intern at the Multnomah County Hospital, has entered into partnership with Dr. C. W. Hamilton at Hood River.

WASHINGTON

Hospital Plan to be Submitted to Voters. At a recent meeting the board of commissioners of King County it was determined to submit to the voters at the November election the question of the construction of a new County-City hospital. This decision was reached by the commissioners after they had learned from Dr. E. T. Hanley, Seattle health commissioner, that the Seattle City Hospital has lately been so overcrowded that admission has had to be refused to several persons seeking entrance. It is estimated that the new institution will cost between $2,000,000 and $3,000,000. At a late date Mr. James M. Sparkman, chairman of the board, declared his belief that the commissioners should vote a $50,000 emergency appropriation to provide for an immediate addition to the present King County Hospital. He stated this was necessary in order to properly provide for patients, pending the actual completion of a new County-City hospital.

Hospital Enlarged. Providence Hospital, Seattle, has completed a six story concrete and brick addition at a cost of $600,000. It is the nurses' home, built to accommodate 200 nurses. It contains an auditorium, class rooms and all other features of such an institution. This releases space in the hospital which will provide accommodations for 200 additional patients, making the total capacity for 500 patients.

Addition to Hospital. At King County Hospital, Seattle, a two story frame structure has been completed which will house twenty-five nurses and the staff of five interns. This releases rooms in the hospital that will care for 50 patients, making a total capacity for 285 patients. The County Commissioners have provided for construction of an addition that will accommodate 80 additional patients.

Tuberculosis "Cure" Tested. The results of a thorough trial of the merits of "Pul-Bro-Tu," the alleged tuberculosis remedy exploited by Geo. A. Kirkpatrick, Portland veterinarian and chiropractor, were recently announced by Dr. E. T. Hanley, Seattle commissioner of health. The tests were carried out at the Firland Sanatorium, under personal direction of Dr. Robert M. Stith, superintendent. Thirty patients were used in the investigation and these were divided into three groups of ten. One group received "Pul-Bro-Tu," another was given potassium iodide, which is said to be the principal constituent of the "cure," while the third or control group received colored water. At the conclusion of the trial, the remedy was declared worthless.

HOSPITAL EXECUTIVES MEET AT LONGVIEW. The board of trustees of the Northwest Hospital Association held a meeting at Longview March 9, at which plans were laid for the annual convention of the association, which will take place at Longview in July or August.

RESULTS OF BASIC SCIENCE EXAMINATIONS. At the two examinations prior to passage of the Basic Science Act licenses were issued to 48 chiropractors, 44 drugless healers, 38 osteopaths and 47 doctors of medicine, the latter being 27 per cent of the total 177. At the two examinations held since passage of this law licenses have been issued as follows: Chiropractors 1, drugless healers 0, osteopaths 6, doctors of medicine 80, the latter being 93 per cent of the 87 applicants examined.

HEATH COMMISSIONER REAPPOINTED. Upon the recommendation of Mayor Bertha Landes, the Seattle City Council March 12 voted to reappoint Dr. E. T. Hanley as health commissioner for a five year term. Later the Council voted to increase the salary from $5000 to $7500.

HEALTH OFFICER RESIGNS. Dr. H. H. Smith of Yakima, who has served as city and county health officer since 1919, has resigned following a leave of absence of nearly a year. Dr. Henry Storgaard, acting city and county health officer, has filed application for appointment to the position. His appointment has been recommended by the Yakima County Medical Society.

THE ANNUAL BANQUET of King County Medical Society was held at Washington Hotel, Seattle, on evening of March 10. The largest attendance in the history of the society was noted, representing a goodly portion of its five hundred members, as well as visitors from adjacent cities. Genial Dr. Arthur Burns, as toastmaster, skillfully guided the speechmaking by society members and the special guests, President Spencer of University of Washington and Judge Calvin Hall. A feature of the evening was music by the medical quartette and the large orchestra composed of musicians from the society.

SMALLPOX APPEARS AT ODESSA. Following the discovery late in February of several mild cases of smallpox in school children at Odessa, Dr. C. N. Baumgartner issued an order that no child be admitted to the schools until he had been vaccinated.

OFFICERS ELECTED. At a meeting of the Physicians Club of Bellingham, held March 17, the following officers were elected for the ensuing year: President, Dr. G. N. Belyea; vice-president, Dr. I. W. Powell; secretary, Dr. Ruth Boring Thomas.

ELECTED TO SCHOOL BOARD. Dr. C. W. Sharples of Seattle was reelected March 13 for a third term as a member of the Seattle school board.

SNOHOMISH COUNTY MEDICAL SOCIETY held a meeting at Everett March 6. Dr. J. A. Weber of Seattle delivered an address on diseases of the bronchial tract.

DR. F. H. GRADY, formerly of the Northern Pacific Hospital, Tacoma, has taken over the practice of Dr. M. P. Dorman of that city. The latter has gone East to engage in postgraduate study.

DR. T. W. KELSEY, who has been engaged in practice in Spokane for several years, has moved to California.

DR. BLOXHAM of Sunnyside has sold his practice to Dr. Richard Embree of Prosser, and has moved to Yakima.

DR. H. T. ALLISON of Granite Falls has disposed of his practice to Dr. W. C. Hills of White Bluffs. Dr. Allison intends to locate at Portland.

DR. OWEN TAYLOR of Auburn has been confined by illness at the Swedish Hospital, Seattle.

IDAHO

CREDIT ASSOCIATION FORMED. Several physicians of Twin Falls recently filed articles of incorporation of the Physicians Credit Association. The purpose of the corporation is to compile ratings of credit and to aid in the collection of accounts, and the legal actions incidental to medical practice.

POCATELLO MEDICAL SOCIETY held a meeting at Pocatello March 1. Dr. J. C. Landenberger of Salt Lake City, chief surgeon of the Oregon Short Line Railroad, delivered an address on "Fractures of the Spine and Pelvis."

SOUTH SIDE MEDICAL SOCIETY held a dinnner meeting at Twin Falls March 6. Dr. C. F. Ensign of the United States Veterans' Hospital at Boise, delivered a paper on the subject of tuberculosis. Motion picture films supplied by the National Tuberculosis Association were shown.

DR. D. O. BEAL of Montpelier is convalescing from an operation for intestinal obstruction, which was performed at the Montpelier Hospital Feb. 29.

DRS. C. W. DILL AND E. W. FOX of Shoshone have entered into partnership.

OBITUARIES

DR. RICHMOND KELLY, a native of Portland, Ore., and a pioneer physician of that city, died suddenly at his home Feb. 22, aged 72 years. He was born in 1855, and graduated from the Miami Medical College, Cincinnati, Ohio, in 1884. He returned to Portland the following year and engaged in practice there. He also served as professor of obstetrics and microscopy in the medical department of Willamette University, and in 1891 was appointed dean.

Dr. C. E. Martin, Buckley, Wash., died at his home Feb. 29, following a lingering illness, aged 53 years. He was born at Ashawa, Ontario, in 1875. He had been engaged in practice at Buckley for the past eighteen years. Previous to that time he was located at Enumclaw.

Dr. William R. Laidlaw, Portland, Ore., died unexpectedly at his home March 16, aged 74 years. He was born at Ontario, Canada, in 1853, and graduated from the Detroit College of Medicine and Surgery in 1896. He had lived in the United States for the past thirty-two years and formerly had practiced in Milwaukee, Wis., before moving to Portland.

Dr. Howard Hamilton, Curry, Ida., died at Twin Falls County general hospital March 17, following an operation, aged 59 years. He was born at Harrison, Ill., in 1868, and graduated from the College of Physicians and Surgeons (now the University of Illinois College of Medicine) in 1895. He practiced in Illinois for twenty years before locating in Idaho.

Dr. Charles Simpson West, Portland, Ore., a retired surgeon of the United States Army, died at his home March 8, aged 80 years. He was born at Philadelphia, in 1847.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., E. L. Zimmerman; Secty., C. E. Hunt

A meeting of Central Willamette Medical Society was held at Osburn Hotel, Eugene, March 1. The banquet was at 6:30 p.m., sixty members and guests being present.

The program was opened by a paper, "Sacroiliac Strains, Diagnosis and Treatment," by Dr. Otis F. Akin, Portland. Discussion was opened by Dr. F. H. Thompson, Salem. The next paper, "An Important Message," was presented by Dr. Hugh Mount, Oregon City, President of the State Medical Society. Doctors from southern Oregon were invited as guests. Also guests were present from Roseburg, Medford and Marshfield.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

A General Meeting of King County Medical Society was held in the Auditorium of the Medical-Dental Building, Seattle, March 5, at 8:15 p.m., President D. C. Hall in the chair. One hundred thirty members and guests were present. Minutes of the meeting of Feb. 6 were read and approved.

Dr. W. H. Orr was elected to membership. Applications were read from Drs. H. C. Christopher, E. E. Grant, W. D. Hunt, J. J. Markey and T. P. Ratigan.

Dr. C. F. Eikenbary read a paper, "Supracondylar Fractures of the Elbow," illustrated with lantern slides. Of the fifty-five cases reported, end-results were known in fifty-one, of which 87 per cent were perfect results; two cases had 110 degrees of motion, two had 80 degrees and one 70 degrees. All cases showed posterior displacement. Satisfactory result of treatment depends primarily upon accuracy of reduction. Details of treatment were explained. Volkman's contracture was considered. It is caused by interference with blood supply from any cause. The paper was discussed by Dr. Homer Dudley.

Dr. J. H. Snively read a paper, "Luther Burbank, His Life, Methods and Work," illustrated with colored lantern slides, showing the various fruits and plants which he introduced. His life was described on his father's farm in Massachusetts, where he developed the famous Burbank potato. After moving to California he continued his experimental work on a most elaborate basis, multiplying new fruits and vegetables well known to everybody. The speaker described in detail some of these products, demonstrating the wide extent of Burbank's labors which spread his fame to all nations. He quoted Burbank's speculations concerning the possible breeding of humans according to principles of animal and plant life.

President Hall discussed some of the effects of the Basic Science Law as illustrated by statistics from examinations of applicants for licenses in the state.

A meeting of the Medical Section of King County Medical Society was held March 12, in the Auditorium of the Medical-Dental Bldg.

Dr. C. F. Davidson discussed the "Significance of the Sugar Tolerance Test." Blood sugar estimations play an important part in the understanding of metabolic problems. Under fasting conditions blood sugar normally varies between 80 and 120 milligrams per 100 c.c. The alterations of this normal condition were discussed. The glucose tolerance curve was considered and the significance of its rise and fall. Factors influencing the facility of oxidation and storage of glucose are active metabolic processes and a more liberal supply of insulin. The variations of these different factors were presented, and case reports were detailed, illustrating various features under consideration. The paper was discussed by Drs. G. C. Miller and C. H. Hofrichter.

Mr. W. E. Gibb, director of laboratory, Virginia Mason Hospital, read a paper, "A Study of the Colloidal Benzoin Reaction in Cerebrospinal Fluids." He described a new and simple test for the differentiation of general paresis from tabes or other forms of neurosyphilis, with charts and explanations of apparatus, and described the technic and method of interpretation.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. C. Wheeler; Secty., W. B. Peinsly

The regular meeting of Pierce County Medical Society was held in its rooms at Tacoma, February 28, Dr. Ernest C. Wheeler in the chair. Minutes of the previous meeting read and approved.

The transfer of Dr. Eber Kanaga from Wayne County Michigan Medical Society was accepted by the society. The application of Dr. Frank H. Grandy was read and referred to the Board of Trustees.

Dr. Brobeck gave a report of 700 obstetric cases delivered by podalic version and extraction. The paper was illustrated with motion pictures, showing the technic. It was discussed by Drs. T. S. Steagall, E. W. Janes, C. H. Kinnear and Charles McCreery.

Dr. E. A. Rich showed three cases treated by Dr. Putti's method of treating osteomyelitis.

Dr. Wheeler introduced Dr. Wallace Terry, Professor of Surgery at the University of California, who spoke briefly of his impressions of the Northwest.

He also introduced Dr. A. S. Lobinger, of Los Angeles, President of Pacific Coast Surgical Association, who gave an interesting talk on gallbladder surgery and diagnosis.

Dr. Homer Dudley, of Seattle, also made a few remarks.

The following report was made of the trustees' meeting: The trustees were authorized additional library expenditure for a desk and other needed furniture under the direction of Dr. Wheeler; they also authorized the usual library expenditures for books and magazines when approved by the Library Committee. They approved the action of the society in voting the Better Business Bureau contract for 1928. Report of the Banquet Committee was read, which showed there was a deficit. This was ordered paid.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., E. J. Rhodes; Secty., A. E. Lange

Walla Walla Valley Medical Society held its regular monthly meeting at Walla Walla, March 10.

A symposium on diseases of the thyroid gland was presented as follows: "Observations on the Treatment of Goiter in Europe," by Dr. J. W. Ingram; "Pre- and Postoperative Treatment of Goiter," by Dr. W. A. Pratt; "Treatment of Simple and Toxic Goiter in Pregnancy," by Dr. H. C. Cowan; "Treatment and Management of Goiter in Adolescence," by Dr. F. M. Campbell; "Treatment of Acute Thyroiditis," by Dr. E. E. Hill.

PUGET SOUND ACADEMY OF OPTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., E. C. Wheeler; Secty., A. E. Hillis

The monthly meeting of the society was held at Seattle, March 20. It was devoted to the presentation and discussion of a number of very interesting clinical cases.

Dr. Goss, Seattle, presented a case of proliferating retinitis of some months standing, both eyes showing floating opacities, hemorrhages and retinal proliferation. Since instituting treatment no further hemorrhage has taken place and it is hoped the progress of the disease has been arrested.

Dr. Schoffman, Seattle, showed two cases of vernal catarrh, both boys eleven years old not related, one having had the disease seven years and the other five. Treatment was discussed. Living in the open air at the beach with frequent swimming in salt water gives most relief.

Dr. McCoy, Seattle, exhibited a case of skin graft for restoration of the orbit following lime burn, enucleation and symblepharon. His second case was one of keratoconnus with almost total loss of vision in the left and about fifty per cent loss in right. The third was a case of persistent hyaloid arteries in both eyes in a girl of six. The fourth was a case of double congenital nuclear cataracts also in a school girl.

Dr. Cameron, Tacoma, presented a case of glaucoma complicating a typical acromegalia.

Dr. Webber, Seattle, read a case report and showed a specimen of aortic aneurism with rupture into the bronchus, in which the diagnosis was made with the bronchoscope. The patient had a four plus Wasserman and improved considerably under antileutic treatment. Over a year later the aneurism ruptured into the bronchus causing instant death.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

THE MECHANICS OF THE DIGESTIVE TRACT. An introduction to Gastroenterology By Walter C. Alvarez, M. D., Associate Professor of Medicine, University of Minnesota (The Mayo Foundation). 100 Illustrations. Second Edition. 447 pp. $7.50. Paul B. Hoeber, Inc., New York, 1928.

This work deals largely with the physiology of the digestive tract. Those familiar with the writings of Alvarez will appreciate that he is especially gifted in style and expression, and that this book is therefore particularly interesting for this reason, besides the fact that the author is himself an independent investigator. In respect to peristalsis, beginning with the postulate of Bayliss and Starling, that food goes down the gut because excitation at any point excites contraction above and inhibition below, if cerebrospinal reflexes be excluded, the author finds this but partially explains the actual facts. He finds that stimulation at any point leads to holding back of material coming from above, and the hurrying forward of material already below. Then he finds that ingredients in relation to peristalsis are of great importance. A gradient is a gradation, usually in some attribute, state, force or activity, which is to be found between certain limits in space or time.

As a practical application we have the gradient in relation to the heart, as stated by Gaskell, that the rhythmical power of each segment of the heart varies inversely as its distance from the sinus. Thus we find the nearer the sinus the greater is the tendency of the heart to beat rhythmically and the greater the rate, while the ventricle will be slower to start beating and will have a slower rate. In like manner a rhythmicity is seen in the bowel, beginning at the pylorus and amounting to a rhythmic contraction of about twenty per minute in the duodenum of the rabbit, and to about ten in the ileum. The basic gradient in an organ is fundamental and not the result of functional adaptation. Tissue cultures from an auricle beat two or six times faster than fragments of ventricle. This gradient of rhythm is produced by metabolic activity or rate of the chemical processes in the part.

There is some very interesting and practical physiology applied to the gallbladder. Pain in gallbladder disease is affirmed not to be due to contractions of the gallbladder or to stone in the common duct, because the muscle of the gallbladder is too sluggish, and severe colic is observed after the removal of the gallbladder and also colics often occur without stone and where the ducts have been obliterated by disease. All experienced clinicians have been puzzled by pain under these circumstances. Alvarez attributes the colics to cramp-like contractions outside the biliary tract, perhaps in the neighborhood of the stomach and duodenum. By the x-ray such contractions have been seen. Morphine in therapeutic doses is said to have no effect upon the gallbladder. The writer does not place much importance on the Meltzer-Lyon technic in diagnosis or treatment and thinks perhaps fatty meals would be more likely to empty the gallbladder, as now daily generally practiced in gallbladder diagnosis. In regard to the controversy as to whether the sphincter should be named after Gage its discoverer, or Oddi who made it known to the world, Alvarez remarks that the man who discovered a cure for tuberculosis and published it in a small out-of-the-way journal and let it be forgotten would deserve, instead of praise, a jail sentence.

This is a book of great interest and value because, no matter how little practical value any new knowledge may seem, its ultimate worth may prove inestimable. As President Charles W. Eliot once said, when cold storage first came into being, that it had at least made the study of anatomy possible as never before by enabling medical schools to keep an inexhaustible store of essential cadavers and rendered unpopular raids on graveyards no longer necessary.

WINSLOW.

GYNECOLOGY. By Howard A. Kelley, A.B., M.D., LL.D., and Collaborators. 1043 pp. $12.00. D. Appleton & Co., New York and London. 1928.

"Not often does one man have a chance to write two books on the same subject at an interval of a generation," states the author of this work, and we might rightly add seldom has the medical world the privilege of having such a complete resume of a generation of a gynecologic experience as has been summed up in this volume. Many notable changes have taken place in gynecologic practice during this period.

Each chapter of this book, initialed by the author or one of his collaborators, deals with a subject common in the experiences of every gynecologist. Taken together they cover the whole scope of gynecology, treating concisely and thoroughly each subject which is discussed. The latest and most approved methods of treatment are outlined, selected according to the needs of each pathologic condition. The treatment of carcinoma of the cervix is now a mooted question. Herein are radium and x-ray accorded rightful consideration. Foreign protein therapy, by Gellhorn, is given considerable space, and its detailed administration is well outlined. The chapter on peruterine tubal insufflation in sterility, by Rubin, is very complete and will greatly add to the value of the book, in that heretofore so little has been accomplished in the treatment of this condition. A chapter on backache briefly reviews the various spinal and joint disorders, describing their etiology and symptomology. Lack of space forbids the enumeration of the many fascinating chapters in this work.

The superlative illustrations, which characterize all of Kelly's works, appear profusely in this book. Numbering nearly 800, they clarify in a graphic manner every operative procedure presented. Some of them are beautifully executed in colors of a truly artistic character. Everyone interested in gynecology, whether specialist or general practitioner, will find this a most useful volume, so complete in illustrations and up-to-date in all recent advancements in the gynecologic field.

MCCURDY.

SAFEGUARDED THYROIDECTOMY AND THYROID SURGERY. By Charles Conrad Miller, M.D. Cloth. 261 pp. $3.75. F. A. Davis Co., Philadelphia, 1928.

The purpose of this book is to emphasize certain phases of diagnosis and treatment of thyroid diseases. Special stress is laid upon early symptoms in patients who show no conspicuous enlargement of the gland, exophthalmos or tremor. Changes in the heart and circulation are discussed as the earliest and most dependable evidence of hyperthyroidism. Tachycardia and a lowering of the cardiac reserve are considered to be invariably present in all degrees of hyperthyroidism. Exception is taken to the old impression that organic heart disease seldom develops from hyperthyroidism. An explanation is given of the mechanism concerned in the production of thyroid heart disease and a discussion of the early symptoms produced by this change. It is pointed out that tachycardia can not persist for long periods without influencing the heart muscle for the reason that diastole or the rest period is shortened so that the heart musculature is kept in a chronic state of fatigue and dilation. With the heart in a chronic state of overfatigue response to stimuli becomes irregular and imperfectly manifests itself in the various abnormalities of rhythm which may give way to fibrillation. This concise and logical consideration of the cardiac and circulatory changes is the outstanding feature of the book.

Other symptoms and findings are discussed as to their incidence, importance and diagnostic value. Special diagnostic methods, such as the Goetsch, Bram, Kottman and glycemic reactions, are reported with a considerable amount of detail. It has been demonstrated, however, that these tests have little practical diagnostic value. Even an elevated basal metabolic rate cannot be accepted as positive evidence of hyperthyroidism, for occasionally an increased metabolic rate may occur in nearly any condition, including very rarely apparently normal individuals.

The World War soldiers, with a diagnosis of shell shock, effort syndrome, and neurocirculatory asthenia, are regarded in the majority of instances by the author as early or atypical forms of Grave's disease but he does not state why. Authorities both on thyroid and mental diseases take the opposite view and consider these cases manifestations of a constitutional-inferiority-makeup that is entirely distinct pathologically and clinically from Grave's disease. In connection with this group of patients the subject of borderline cases is introduced, in which the diagnosis between the various types of neuroses and hyperthyroidism offers many difficulties, but no attempt is made to distinguish between the two. This most important diagnostic problem in thyroid diseases might well have received further consideration.

The medical treatment of goiter in adults is considered largely as a preparatory one for operation. In adolescence the use of iodine and thyroid preparation is found to have a curative effect.

The evolution of thyroid surgery is discussed, pointing out the particularly valuable contributions that have been retained to the present and also the dangerous features of thyroidectomy as practiced today. Objection is made to the method of separating the gland from the surrounding tissue by blunt dissection on the grounds that venous bleeding often results which presents a serious complication for the surgeon, and that vascular segments of the gland are clamped and all the vessels in the grasp of the clamps permanently occluded, so that the blood supply to the gland is entirely cut off. The author feels that the proper method of doing a thyroidectomy is to surround a gland with a row of hemostats placed close against the gland so as not to disturb large blood vessels in facial layers distant from the gland. He advocates leaving only a small amount of gland tissue with the blood supply intact, believing that glandular tissue sufficient for the needs of the body will regenerate. It is his opinion that inadequate surgery is done because of the fear of myxedema and that the adoption of his technic would do away with this fear so that a more effective type of operation would be performed. MAYFIELD.

TREATMENT OF DISEASES IN INFANTS AND CHILDREN. By Hans Kleinschmidt, M.D., Professor of Pediatrics at the University of Hamburg, Fifth Edition. Translated, with additions, by Harry M. Greenwald, M.D., Attending Pediatrician to the United Isreal Zion Hospital, etc., Brooklyn. 359 pp. $5 net. P. Blakiston's Son & Co., Philadelphia, 1928.

The author states this work was written primarily to provide a collection of therepeutic measures which have been found of definite value in pediatric practice. He believes drugs play a secondary role in the treatment of sick children, and in keeping with this conviction he has stressed dietetic and physical methods of cure. The translator has inserted many supplementary paragraphs, based on his own experience and the practices of American pediatricians. The first chapters are devoted to the general management of infants, both in health and in disease. Kleinschimdt is one of the foremost European authorities on infant feeding. Consequently his discussion of that subject is of great value. He makes frequent use of butter-flour mixtures in malnourished infants. Although he recommends buttermilk and protein milk, he makes no mention of lactic acid milk, a dietary medium employed extensively in the United States in recent years.

Under the subject of infection of the tonsils, the author describes tonsillotomy, an operation which apparently still enjoys popularity in Germany. He does not consider that the physician commits a sin when he allows an infant's inflamed ear drum to rupture spontaneously; in fact, he asserts that "paracentesis does not improve the course of the disease in infancy . . ."

The diseases of each bodily system are grouped in individual chapters. In place of mere recommendations to use a certain drug, the author writes definite prescriptions, in which the drug is included. Diets and physiotherapeutic measures are likewise described in painstaking detail. Since treatment has been given scant space in several of the recent works on pediatrics, this small volume, which is entirely devoted to the therepeutics, fills a real need and is therefore commended to the practicing physician as a valuable aid in the care of the sick infant or child. OLMSTED.

PATHOLOGICAL PHYSIOLOGY OF INTERNAL DISEASES. Functional Pathology, By Albion Walter Hewlett, M. D., B. S., Formerly Professor of Medicine, Stanford Medical School, etc. Revised in Memoriam by his Colleagues, Thomas Addis, M. B., Ch. B., M. D.; George DeForest Barnett, A. B., A. M., M. D.; Walter Whitney Boardman, M. D.; Ernest Charles Dickson, A. B., M. B., M. D.; Henry George Mehrtens, B. S., M. D.; William Ophuls, M. D.; Jay Marion Read, B. S., M. S., M. D.; Howard Frank West, A. B., M. D.; Harry Alphonso Wyckoff, A. B., M. D. Under the Editorial Supervision of George DeForest Barnett. With 164 Illustrations in Text. 787 pp. $8.50. New York and London. D. Appleton and Co., 1928.

The first edition of this work was published in 1916 as Volume I of Monographic Medicine. Professor Hewlett had an ideal preparation for the writing of such a book. He began as a physiologist, while his later work was in clinical medicine. His writings indicate that he always kept something of the point of view of the physiologist while doing his clinical work. In 1905 he translated Professor Krehl's "Pathologische Physiologie" from its third German edition, and again in 1907 from its fourth German edition. At that time he regretted that the term "pathological physiology" was unfamiliar to American readers, and the translation was issued under the title of "clinical pathology." In the first edition of his own work he used the title of "functional pathology of internal disease."

At the time of his death, in 1925, he was preparing the present edition, and later the work of revision was completed by his colleagues at Stanford Medical School. With a background of this nature

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much might be expected from a preparation such as his, and the volume measures up to one's expectations, but since it consists entirely of fundamentals it does not lend itself readily to review. It is written in a fascinating manner, and contains as much of the subject as can be crowded into a volume of its size.

GRISWOLD.

THE EXTRA-OCULAR MUSCLES. A Clinical Study of Normal and Abnormal Ocular Motility. By Luther C. Peter, A. M., M. D., Cc. D., Professor of Ophthalmology in the Medical Department of Temple University, etc. Illustrated with 98 Engravings and 5 Colored Plates. 294 pp. $4.00. Lea & Febiger, Philadelphia, 1927.

Much has been written in the past concerning the extra-ocular muscles and the present volume, although it contains little that is new, does give a clear-cut presentation of the subject from a clinical point of view. The author purposely omits discussion of various theories and mathematical calculations and treats the subject from the point of view of the practicing oculist, to whom the cases of muscle imbalance and other muscle disorders are a constant source of concern. The oculist will find many helpful points in this work, even though his library may be well stocked with literature on the same subject.

BRUGMAN.

THE YOUNG MAN AND MEDICINE. By Lewellys F. Barker, M.D., LL.D., Professor Emeritus of Medicine, Johns Hopkins University. 202 pp. The Macmillan Company, New York. 1928.

This book is written in a charming literary style, as would be expected from this author. He states his purpose is to help young people who desire to compare the advantages and disadvantages of a medical career, and to aid those who, having entered upon this career, are seeking information that may be serviceable in guiding them toward success and usefulness in it. After discussing the matter of decision regarding a life career, he considers service renderable by the medical profession in our social organization. He presents the advantages and disadvantages of specialism, quoting the definition of a specialist as "one who learns more and more about less and less." He warns against the practice of the ultraspecialist who confines his attention to the disorders of a single organ. Under "Personal Rewards and Satisfactions of Medical Workers" he outlines these considerations as physical, economic, social, intellectual, esthetic and ethical, dilating upon each of them. There are personal qualifications desirable for one entering a medical career which the youthful aspirant might well contemplate. Every medical student and youthful practitioner would profit by reading this volume.

OPHTHALMOSCOPY, RETINOSCOPY AND REFRACTION. By W. A. Fisher, M. D., F. A. C. S., Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College, etc. Second Revised and Enlarged Edition. With 260 Illustrations, including 48 Colored Plates. 291 pp. $3.75. F. A. Davis Co., Philadelphia, 1927.

The fact that this is the second edition shows there has been a demand for a book of this kind. It attempts to present the very complex subject of refraction in a simple way but the subject is too large to be treated in a compend of this character. The beginner will find it rather involved in spite of its sketchiness, while the experienced ophthalmologist will find it rather elementary. The chapter by Von Der Heydt on newer methods of diagnosis is very well done but owing to the limited space slit lamp microscopy, binocular ophthalmoscopy and red free light are scarcely more than defined.

BRUGMAN.

PRACTICAL DIETETICS FOR ADULTS AND CHILDREN IN HEALTH AND DISEASE. By Sanford Blum, A.B., M.S., M.D., Head of Department of Pediatrics, and Director of the Research Laboratory, San Francisco Polyclinic and Post Graduate School. Third Revised and Enlarged Edition. 380 pp. $4.00. F. A. Davis Company, Philadelphia. 1928.

The author states that a dietary, besides being correct from a medical standpoint, should be of such a nature that the patient can and will follow it. It should provide a variety and freedom of choice, inflexible rules and strict limitations being prone to be disregarded. The general belief that milk is excellent food for all people and all cases is erroneous. While its value for infants and children cannot be overestimated, for adults it has many objectionable features. The lists of foods in this book specify the more important articles under each heading, being classified as permitted and forbidden viands.

Part I presents a dietary for adults in health and disease. The diseases are enumerated alphabetically, suitable diets for each being outlined with specifications as to preparation, including cooking and other details. Part II presents a dietary for infants and children in health and disease. Feeding is divided into that for the first year, the second year, and second to fifteenth year. Much valuable information is provided in the various discussions concerning meals for these varying conditions. One will find this an interesting and suggestive volume.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 8, Number 1. (Lahey Clinic Number—February 1928.) 210 pages, with 74 illustrations. Per clinic year (February 1928 to December 1928). Paper, $12.00; Cloth, $16.00 net. W. B. Saunders Company, Philadelphia and London.

This volume presents six reports by Lahey, dealing with common duct stone, thyroidectomy conditions, gastrojejunal ulcers and esophageal diverticulum. Of the latter he has operated upon thirteen cases with no mortality. He says that under local anesthesia and two stage removal no patient is too bad a risk for operation. Sise illustrates the usefulness of ephedrin as an aid in spinal anesthesia, which is superior to adrenalin used for the same purpose. He also considers the benefit from use of carbon dioxide during inhalation anesthesia as a physiologic stimulant to respiration. By its use control over the patient is obtained which cannot be secured in any other way. Many other interesting surgical procedures are presented and discussed in this volume.

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ORIGINAL CONTRIBUTIONS

THE UPPER URINARY TRACT

A CONSIDERATION OF ITS SURGICAL LESIONS *

VERNE C. HUNT, M.D.
ROCHESTER, MINN.
Division of Surgery, Mayo Clinic,

A review of the major surgical lesions of the kidney and ureter operated on at the Mayo Clinic during the years from 1922 to 1926, inclusive, has permitted the consideration of approximately 1550 operations which serve as a basis for certain facts and observations presented here. Nephrectomy was performed in 916 cases; in 127 of these for renal malignancy, an incidence of 13.8 per cent, with ten deaths, a mortality rate of 7.8 per cent. There were 789 nephrectomies for benign renal disease with seventeen deaths, a mortality rate of 2.1 per cent. Six hundred thirty-five conservative operations on the kidney and ureter were largely for lithiasis.

The symptoms of intraabdominal disease and those of disturbances of the urinary tract are often sufficiently atypical, not alone to be confusing in diagnosis, but to be entirely misleading. At times, by virtue of referred pain, acute seizures from gallstones and those from renal and ureteral stones may be clinically indistinguishable. The frequency with which the appendix, and often the gallbladder, is removed for symptoms that have been produced by ureteral or renal calculus emphasizes the necessity of urologic investigation, if there is doubt regarding the accuracy of diagnosis. Cystoscopic and allied methods of examining the urinary tract have resulted in almost exact diagnosis of the major surgical lesions of the bladder, ureter and kidney. Visualization by the cystoscope of the interior of the bladder, together with roentgenograms, cystograms, ureterograms and pyelograms, reveals to the competent interpreter deviations from normal which constitute trustworthy signs of anatomic anomalies and of early surgical lesions, as well as of the advanced and extensive surgical lesions. Tests of renal function have been available long enough to have proved their worth as a guide to the time and method of treatment and as a means of relative prognosis.

Exact methods of distinguishing lesions of the urinary tract from intraabdominal lesions are available and indispensable in diagnosis. The differential diagnosis of many abdominal tumors is incomplete without pyelographic interpretation of the question of intrarenal or extrarenal involvement. The presence of roentgenographic shadows in the region of the urinary tract and the presence grossly or microscopically of red blood cells and pus cells in the urine should establish the necessity for thorough and efficient urologic examination. The interpretation of urologic observations has become so accurate and reliable that diagnostic exploration of any part of the urinary tract is rarely necessary. It is obvi-

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* Read before Seattle Surgical Society, Seattle, Wash., Jan. 14, 1928.

ous that in the consideration of surgical lesions of the urinary tract competent urologic diagnosis is most important.

LITHIASIS

Lithiasis is the most common surgical lesion encountered in the upper part of the urinary tract, comprising in this series 55 per cent of those for which major operations on the kidney and ureter were necessary, and 49 per cent of the surgical lesions of the kidney. Considerable difference of opinion exists regarding the etiology of renal and ureteral lithiasis. The theory of foci of infection is generally agreed on, but there are other factors, still undetermined, which play an important part. The most common constituents of calculi are oxalates, urates and phosphates; these are the most insoluble constituents of urine, and are held in solution to a higher degree in urine than in water; in the normal person and in normal urine, even though when present in excess, under certain conditions they retain the form of individual crystals.

It would seem that calculus formation must be on the basis of chemical precipitation of the oxalates, urates and phosphates in a manner that provides agglutination of their crystals to the development of concretions. Just what the mechanism may be has not been ascertained. However, that chemical changes incident to the advent of bacterial invasion of kidney and urine may produce the precipitation can hardly be overlooked. Rosenow's theory of specificity of organisms is most important in the consideration of the etiology of lithiasis. He has shown that certain strains of bacteria have definite specificity, thus establishing infection as a most significant factor, but just what the mechanism is by which precipitation and fusion of normal constituents of urine proceed to stone formation is apparently unknown.

RENAL LITHIASIS

Braasch has presented data showing that stones in the kidney are multiple in more than 40 per cent of the cases and that in approximately 10 per cent they are bilateral. Single stones are usually situated in the pelvis and are readily accessible by pelviolithotomy. Multiple stones may be confined entirely to the pelvis, but usually if more than two in number, they occupy the major calices. Experience has shown that all cases of bilateral renal lithiasis do not clearly indicate bilateral operation. In many instances the stone in one or the other kidney is small and, if given opportunity, may pass spontaneously without operation. Certainly in the absence of symptoms referable to the small stone, when the indications are clear for operation on the opposite kidney, time and opportunity should be given for passage of the smaller stone before bilateral operation is undertaken. However, when the indications are clear for bilateral operation, a question regarding the procedure sometimes arises. In my experience, except under unusual circumstances, it has not been advisable to perform the operations simultaneously but to operate on that kidney first to which the acute symptoms are referable, everything else being equal. In the absence of acute symptoms, but with distinct evidence of marked difference in the amount of renal injury incurred by the presence of stones, it has seemed best to operate first on the kidney with the better function, in order to take advantage of the function remaining in the poorer kidney during the acute stages following operation.

Such a rule immediately presents the question of how much reliance may be placed on the differential functional tests in the presence of lithiasis. Experience has shown that it is difficult to estimate renal function accurately in such cases. Under certain conditions, difficult to explain in the absence of obstruction at the ureteropelvic juncture, there may be marked inhibition of secretion. Low differential functional estimations have frequently been observed, indicating a degree of renal injury sufficient to necessitate nephrectomy. At operation a relatively sound kidney has been found and after a conservative operation for the removal of stone it returns to normal function as evidenced by the phenolsulphonephthalein output.

It has been suggested that tests of renal function can give only an estimate of the functional activity of the kidney at the time of examination, and not what the kidney may be capable of doing under normal conditions. To my knowledge no test of renal function is available which indicates the maximal capacity of one or both kidneys. Certain figures have been established indicating normal functional tests which fail entirely in the estimation of renal reserve. A constant relatively low phenolsulphonephthalein return or high blood urea estimation may suggest a narrow margin of renal reserve; however, that normal combined phenolsulphonephthalein return and normal blood urea may be obtained from a single kidney after loss of the other by disease or operation, indicates the inability to measure renal reserve. On the other hand, Williamson's experimental work on transplantation of the kidney is of interest in that it showed marked reduction of the blood urea of an animal with three functioning kidneys, two normal and one transplanted.

TYPES OF OPERATION FOR RENAL LITHIASIS

Nephrectomy was necessary in 229 (33 per cent) of the total number of cases of renal lithiasis. When the kidney is functionless as a result of lithiasis or there is pyonephrosis, or marked infection, the indications for nephrectomy are clear. Large branched stones often give rise to the question of conservatism or nephrectomy. In the presence of adequate renal function, the conservative operation is the one of choice, if the stone can be removed with a minimum of mutilation to the kidney. Nephrectomy is certainly easier than the conservative operation in cases of large branched stones. However, conservation of renal tissue under difficulties distinguishes the surgeon from the "operator." Conservatism is particularly desirable in bilateral lithiasis with multiple stones in each kidney, with infection and reduction in function in both kidneys; it is likewise imperative in case of lithiasis in a solitary kidney.

In five cases death followed operation for lithiasis and extensive infection. In three of these the cause was unusual. One patient was suffering from active pulmonary tuberculosis and nephrectomy was necessary on account of acute pyonephrosis with stones. The postoperative convalescence was uneventful until the evening of the ninth day, when death occurred from sudden profuse pulmonary hemorrhage. Another death occurred nine days postoperatively from general peritonitis, secondary to perforation of stasis ulceration of the cecum, an exceedingly unusual postoperative complication, and one hardly to be reckoned with as a hazard to extraperitoneal operations. A third patient had bilateral lithiasis, and death occurred on the seventh day from renal insufficiency, resulting from obstruction by calculus of the ureter of the opposite side.

There were 440 conservative operations of pelviolithotomy, nephrolithotomy or the combined operations in 417 cases. Stones were removed in 84 per cent of the cases by pelviolithotomy. Even though stones are multiple and are situated in the major calices, they are usually readily removed through the renal pelvis. Pelviolithotomy is the operation of choice for it is least destructive to renal tissue, while nephrolithotomy is an operation of necessity usually for stones in the ends of calices, inaccessible through the pelvis, or for so-called cortical stones, which in reality usually have originated in the calices.

It is possible for renal stones to reform through the persistence of preexisting foci of infection and other indeterminate factors entering into stone formation. There are so-called stone-forming kidneys, which continue to develop calculi even after all demonstrable foci of infection have been eliminated. However, true reformation of stones occurs rather infrequently and experience has shown that the relatively high incidence of so-called reformation of stones has in reality been the continued development of stones overlooked at the time of operation, or of particles incompletely removed, which serve as nuclei for subsequent stones.

Surgeons of wide experience in operating for renal lithiasis have all suffered the humiliation of being unable to find enough stones at operation to account for all the shadows in the roentgenogram, and of having shadows persist after operation. Likewise shadows have often been found immediately after operation when the surgeon was certain he had removed single or multiple stones completely. Multiple stones may overlie each other, and cast only one shadow. Thus the preoperative diagnosis of a single stone is made and the surgeon is entirely satisfied to remove one stone. In other words, overlooking one or more stones at operation is a significant factor in the so-called reformation of stones. Routine roentgen-ray examination a few days after operation is the only means of distinguishing between the oversight of stones and their subsequent recurrence.

The difficulty that the surgeon experienced in locating and removing all multiple stones, and occasional failure to remove all stones as depicted by early postoperative roentgenograms, emphasized the need of aid in the localization of shadows at operation. Braasch and Carman, employing the principle of localization of foreign bodies in tissues at the operating table, devised a method of fluoroscopic examination with the kidney elevated out of the wound. The method has proved invaluable in the detection of even small particles of stony material which otherwise could not have been found, and has afforded reasonable assurance of complete removal of all stones before the conclusion of the operation. To determine definitely that the kidney is clear and free from all stones at the close of the operation has afforded the surgeon and patient greater assurance of a good surgical result, and has practically eliminated the persistence of postoperative shadows in the renal area. Fluoroscopy at the operation has made possible the conservative operation of pelviolithotomy for multiple stones in cases in which nephrectomy was formerly often necessary.

Quinby has advocated the making and developing of films at operation as an aid in the localization of stones and for the assurance of complete removal of all stones. These methods have attained such importance in the surgery of renal lithiasis, that to insure the best results it is questionable whether one is justified in contemplating pelviolithotomy, particularly when the stones are seen to be multiple without fluoroscopic aid or facilities for the rapid development of films at operation.

URETERAL LITHIASIS

During recent years various nonsurgical procedures have been utilized in the removal of ureteral stones. These methods of manipulation have been so eminently successful that approximately 75 per cent of stones in the ureter have been removed or induced to pass by nonsurgical measures. With careful and proper selection of patients for the application of nonsurgical methods, they are safe and usually complications do not result. Large or multiple stones, or small impacted stones producing complete ureteral obstruction are usually not amenable to nonsurgical procedures, but are best accepted as surgical conditions without preliminary attempts at manipulation. Acute complete ureteral obstruction is often productive of chills and high fever with rapid suppression of urine which apparently is reflex in nature, at least so far as the opposite apparently normal kidney is concerned.

In my experience about 70 per cent of ureteral stones that require surgical removal are situated in the lower third of the ureter. It is worthy of repetition and emphasis that accurate localization of stones should immediately precede operation. Most ureteral stones are rough and irregular and therefore do not change position readily. However, a few are perfectly smooth and may occupy any position from the renal pelvis to the ureterovesical juncture in a dilated ureter. Change in position with smooth stones sometimes occurs with great freedom with changes in the position of the patient.

Recently I operated on a patient, in whom the stone had been localized in the film at the ureterovesical juncture immediately preceding operation. At operation, with the patient in the Trendelenburg position, the stone could not be found in its previous position. Careful digital examination of the entire length of the ureter to the kidney resulted in finding the stone in the pelvis of the kidney, from which it was readily manipulated into the lower third of the ureter and removed. The ureter was moderately dilated, facilitating migratory activity of the smooth stone. By virtue of the inward course of the ureter downward the lower third approaches closely the median line of the body and the entire lower half of the ureter is most readily approached through a low median incision.

Ureteral and renal lithiasis on the same side were associated in fifteen cases, in ten of which simultaneous pelviolithotomy and ureterolithotomy were performed. In five cases complete nephroureterectomy was necessary. In twelve additional cases a ureteral stone had been productive of pyonephrosis in seven, and hydronephrosis in five, making necessary nephrectomy and partial ureterectomy to a point below the ureteral stone. When the operation of complete nephroureterectomy is necessary because of stone obstructing the lower part of the ureter, it is best carried out by extraperitoneal exposure of the lower third of the ureter through a low median incision, dividing and ligating the ureter at its entrance to the bladder. The entire lower half may be readily freed and tucked up toward the kidney and subsequently removed intact with the kidney through a posterior incision.

RENAL TUBERCULOSIS

Without entering into a consideration of the diagnosis, it may be stated that the clinical recognition of renal tuberculosis has reached a high state of accuracy, and infection of the kidney is readily detected early. While heliotherapy and other nonsurgical methods of treatment have been advocated, and unquestionably possess some merit, the cure of unilateral renal tuberculosis is usually not accomplished except by nephrectomy. Reservations placed on cure are dependent on the extent of the renal involvement, the presence of tuberculous cystitis, or the activity of tuberculous lesions elsewhere. Approximately 80 per cent of cases of surgical renal tuberculosis have associated tuberculous lesions; however, the latter, in the absence of general contraindications, should not necessarily deprive the patient of the benefit to be obtained from removal of the major tuberculous lesion, if it is in one kidney. Diffuse miliary tuberculosis is considered a contraindication to nephrectomy. The low primary mortality rate following nephrectomy for unilateral renal tuberculosis justifies the operation, even if there is moderate pulmonary involvement. Braasch has reported a mortality rate of 20 per cent within five years after nephrectomy with a prognosis of partial recovery of 80 per cent of the patients; 60 per cent were completely cured, while 20 per cent had persisting vesical symptoms. The shorter the duration of the disease and the less extensive the renal involvement, the better the result.

Renal tuberculosis formed the indication for nephrectomy in 258 cases, 28 per cent of the various conditions for which nephrectomy was necessary. There were six deaths, a mortality rate of 2.3 per cent. Here, again, unusual causes of death were observed: for example, in two instances clinical postoperative evidence of suprarenal insufficiency was present and necropsy disclosed bilateral tuberculosis of the suprarenals and in one instance pulmonary embolism was fatal on the ninth day.

Indolent healing of the wound and a temporarily persisting sinus at times follows nephrectomy for renal tuberculosis. This is usually due to incomplete removal of diseased tissue, persisting infection of the ureter, and the institution of drainage. While subcapsular nephrectomy is the operation of choice, it is usually inadequate in cases of extensive renal tuberculosis. The perirenal fat is often involved in extensive tuberculous pyonephrosis, particularly if a tuberculous perinephritic abscess has resulted, and its incomplete removal retards healing. The ureter is usually thickened and dilated, and, if not actually tuberculous, presents definite ureteritis, which has in many instances been the cause of a persisting sinus.

In an effort to obviate a postoperative sinus of ureteral origin, various methods of treating the ureter have eben advocated, including injection of its lumen at the severed end with pure phenol, actual cautery sterilization of the stump, and bringing it to the surface of the skin and threading a tube over its end to carry subsequent drainage to the surface. Walters, in a review of a series of cases in which nephrectomy had been performed for renal tuberculosis, and the ureter treated by the various methods, showed that ligation and sterilization of the severed end of the ureter with the actual cautery is the most satisfactory method of treatment; a sinus persisted only temporarily in 25 per cent of the cases. A sinus of ureteral origin in the absence of a ureteral stricture rarely requires ureterectomy.

The insertion of drainage tubes after nephrectomy for renal tuberculosis is as inadvisable as the institution of drainage for tuberculous infection elsewhere. It invites secondary infection, and a postoperative sinus develops with indolent healing of the wound. Closure of nephrectomy wounds without drainage results in primary healing in a high percentage of cases.

INFECTION OF THE KIDNEY

Reviewing the various lesions in this series, exclusive of renal tuberculosis, lithiasis and malignancy for which nephrectomy has been performed, various terms have been used which in many instances probably designate different phases of the same primary lesion. Certainly the primary pathologic process differed little in many of the cases in which the terms "pyelonephritis," "pyonephrosis" and "infected hydronephrosis" were used; the difference existing in nomenclature is, in all probability, on the basis of the degree of renal injury and the amount of infection. The term pyonephrosis indicates extensive infection which is borne out by the difference in mortality rate. There were sixty-three cases of extensive infection classified as pyonephrosis, with four deaths, as opposed to one death in 209 cases of less extensive renal infection for which nephrectomy was performed.

In many of these cases it is difficult to ascribe a cause for the variable amount of infection; however, in many cases of pyonephrosis and pyelonephritis it seems fair to consider a hematogenous origin in accordance with Brewer's concept. Brewer, from his experimental and clinical data, concluded that during the progress of any acute infectious disease a certain number of microörganisms find their way into the blood and that many are excreted through the kidneys. If the number of these organisms is comparatively small, if their virulence is low, and if the kidneys are healthy, their transit through the renal apparatus does not give rise to demonstrable lesions. On the other hand, if the number of organisms is large, and their virulence high, or if one or both kidneys are diseased, lesions are produced which may go on to the development of any of the types of renal infection or suppuration. Brewer concluded, further, that hematogenous infection is responsible for the greater number of cases of renal sepsis, and that even in septic conditions of the lower urinary passages the concomitant renal leions may be of hematogenous origin.

The first of his conclusions is supported by the fact that perinephritic abscess occurs in many instances subsequent to an acute virulent peripheral infection, in which lymphatic metastasis can be excluded. Conclusive evidence is not available in support of the conception that cortical abscess in the absence of primary renal disease is always hematogenous, nor that hematogenous infection always results in cortical abscesses; however, cortical abscess is probably the most common cause of perinephritic abscess in the absence of primary renal disease. The origin of such perinephritic abscesses can usually be traced to a preexisting superficial or remote infection such as boils, carbuncles and osteomyelitis.

Usually the kidney is only slightly injured by perinephritic abscess formation; however, with the process confined in its activity within the renal capsule, generalized renal infection to the degree of extensive pyonephrosis seems logical. Several years ago I reported fifty-nine cases of perinephritic abscess, hematogenous in origin, observed in the Mayo Clinic. In only five cases was the kidney so badly diseased as to require nephrectomy. Habein recently reported forty-four cases, in which the relationship between preexisting superficial or remote infection and perinephritic abscess was definitely established.

PAPILLARY EPITHELIOMA OF RENAL PELVIS

Hypernephroma is the most common malignant lesion in the kidney. When it is very large operability is sometimes questioned; however, experience has shown that a large hypernephroma often possesses less tendency to direct extension than a smaller one, and its operability should be considered, if there is any mobility. The anterior transperitoneal route facilitates removal of large tumors entirely inaccessible through the regular posterior incision. The results of nephrectomy for malignancy are dependent on early diagnosis and operation. Most malignant tumors of the kidney progress by direct extension, and tend to metastasize remotely, which emphasizes the necessity of early recognition and treatment to insure the best results. I shall consider here only a single type of malignant tumor, papillary epithelioma, which differs in its development from all other malignant renal tumors.

Primary epithelioma of the renal pelvis is encountered as one of two distinct types: the flat-squamous-cell, and the papillary. While both are true epitheliomas, the microscopic characteristics of the cells of the two are different, and even though the tumors have the same genesis, they differ materially in the degree of malignancy and manner of growth and extension. On the basis of cellular differentiation the papillary epithelioma is less malignant than the sessile squamous-cell type; and while the latter progresses by direct invasion of tissue and tends to metastasize remotely, the former progresses by direct extension along the mucous membrane to calices and along the ureter to the bladder, and does not tend to metastasize remotely. Because of these characteristics the surgical principles involved differ from those of nephrectomy for all other forms of renal malignancy. Papillary epithelioma of the renal pelvis is the least malignant lesion of the kidney, but failure to distinguish it from the sessile type of epithelioma allows its malignancy to increase, not in degree, but through subsequent recurrence in the ureter and bladder, if it is treated only by nephrectomy. Recently I reviewed the cases of papillary epithelioma of the renal pelvis observed at the clinic and in two-thirds the bladder was involved at the time of examination or it became involved subsequent to nephrectomy, or nephrectomy and partial ureterectomy.

Judd, in 1924, recommended removing the ureter down to the wall of the bladder at the time of nephrectomy, or at a second-stage operation soon afterward, in all cases of papillary epithelioma of the renal pelvis. However, the recent revelation of the high incidence of metastasis to the portion of the bladder immediately surrounding the ureteral orifice, or immediately adjacent to it, emphasizes the necessity of segmental resection of that portion of the bladder to include the intramural portion of the ureter and the adjacent area simultaneous with nephroureterectomy. The combined operation has been performed in six cases since this review. It is readily accomplished with little more time and risk than simple nephrectomy, and offers added assurance against subsequent recurrence.

ANOMALIES OF THE UPPER PART OF THE URINARY TRACT

Anomalies of surgical importance are those of blood supply, position and development. Anomaly of position or development is usually accompanied by an anomalous blood supply. The anomalous blood vessels present many variations and aside from their anatomic interest are of particular surgical significance, when they cause mechanical interference with the emptying of the renal pelvis. Horseshoe and ectopic kidneys often possess anomalous vessels which at times in their course to or from the kidney obstruct the ureter sufficiently to produce intermittent hydronephrosis. Likewise, the anatomically normal kidney, with accessory vessels to the lower pole, often becomes obstructed at the ureteropelvic juncture, resulting in intermittent or progressive hydronephrosis. Considerable difference of opinion exists regarding the mechanism by which accessory vessels to the lower pole of the kidney produce hydronephrosis; however, operative observation reveals conclusive evidence of true mechanical obstruction.

It would seem that simple division of the obstructing accessory vessel should be sufficient to relieve the hydronephrosis, but this has usually proved inadequate, particularly if the renal pelvis was markedly dilated. That simple division and ligation of the obstructing accessory vessels does not always allow recession of the renal pelvis may be accounted for by the loss of the resiliency, elasticity and expulsive power of the renal pelvis, occasioned by intermittent or continuous and progressive dilatation beyond the power of recovery.

To avoid the sacrifice of kidneys possessing a fair degree of function, various plastic operations on the renal pelvis have been devised, none of which has been eminently successful; in most instances subsequent nephrectomy was necessary.

The horseshoe kidney is heir to all the renal lesions. During the last six years in the clinic operation was performed in twenty-three such cases. There were twelve cases of renal lithiasis, in which the stones were removed by pelviolithotomy. In one of these the stones were bilateral. Heminephrectomy was necessary in six cases of hydronephrosis; cysts were drained in two cases, exploration for pain was carried out in two, and accessory vessels were divided in one case.

The relative inaccessibility of the horseshoe kidney because of the mesial posterior position and the immobility exacts precise technic in management. The almost invariable presence of an anomalous blood supply may hazard the surgical procedure; however, accurate visualization of the operative field through an adequate posterior incision usually insures against the accident of operative hemorrhage. Stones in the pelvis of an anatomically normal kidney are most readily removed through the posterior wall of the renal pelvis. The partial inward rotation of the halves of a fused kidney and the extreme anterior position of the pelvis permits access to stones in the pelvis or calices only through the anterior wall of the pelvis. The isthmus of a fused kidney is variable in width but it is usually thin and relatively avascular, facilitating heminephrectomy, when such conditions as hydronephrosis and tumor are present.

Double kidney or complete reduplication of the renal pelvis usually possesses a definite avascular boundary and barrier between the two renal units, each with its own blood supply. Benign surgical lesions may involve only one renal unit to the extent of complete loss of renal function without disturbance of the other unit of the double kidney. Such determinations are entirely within the realm of urologic diagnosis and are readily recognized on exploration. Heminephrectomy was accomplished in two cases of complete reduplication of the renal pelvis. The ectopic or pelvic kidney offers many interesting problems, as do a number of rather rare anomalies. There are a few miscellaneous lesions of the kidney and ureters, which at times test the diagnostic ability of the urologist and ingenuity of the surgeon. However, I have confined myself here to the consideration of the more common lesions of the urinary tract.

SUMMARY

In a review of approximately 1550 operations on the urinary tract, 87 per cent of which were for renal disease, nephrectomy was necessary in 67 per cent of the cases. Malignancy comprised 13.8 per cent of the renal lesions requiring nephrectomy, or 9.3 per cent of all renal lesions. While the mortality rate of nephrectomy for renal malignancy was 7.8 per cent for the entire group, nephrectomy for hypernephroma is accompanied by greater risk than any other form of malignancy, which may be explained by the extent of the disease at the time of operation and the difficulties encountered in removing large renal tumors. There was a mortality rate of 8.4 per cent for hypernephroma, as compared to 6 per cent for carcinoma, epithelioma and sarcoma.

Lithiasis comprised 49 per cent of the surgical lesions of the kidney. Nephrectomy was necessary because of extensive destruction of renal tissue, extensive infection, or both, in a third of the cases of nephrolithiasis. In the conservative operations fluoroscopic aid has been of inestimable value in the localization of multiple stones and a safeguard to the operative oversight of stones. Certainly the incidence of true recurrence after fluoroscopy is less than 5 per cent.

The infections, including unilateral tuberculosis, account for approximately 57 per cent of the major lesions of the kidney requiring nephrectomy, of which tuberculosis comprises nearly half (48 per cent). The operative mortality rate of nephrectomy for tuberculosis is a little more than 2 per cent. Complete cure is offered in 60 per cent, with improvement but persistence of urinary symptoms to a variable degree in about 20 per cent of the cases.

Much remains to be learned with regard to the factors entering into the etiology of lithiasis, and the various infections of the kidney. Likewise, tests of renal function will serve a new purpose when it becomes possible to determine accurately the renal functional capacity.

OBSTRUCTION OF THE VESICAL ORIFICE *

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There exists at the present time, and apparently there has always existed, a great deal of confusion about the subject of obstruction at the vesical orifice. In part, at least, this is due to the fact that so many different terms have been applied to the same pathologic process. The purpose of this paper is to propose a simple classification of the common forms of obstruction, to discuss the pathologic changes present, and to suggest treatment appropriate to each type.

For this purpose we will divide them into (1) adenoma of the prostate, (2) fibrous contracture of the vesical neck, (3) valves of the prostatic urethra, (4) carcinoma of the prostate.

Adenoma of the prostate. McCallum describes the development of adenoma of the prostate as follows: "The prostate is a sexual gland derived from the Wolffian body, as are the seminal vesicles. Its function is to furnish its secretion in jets at the moment of ejaculation. Its musculature, therefore, is arranged around the glands so that it can suddenly exert pressure upon them.

"The internal sphincter of the bladder controls the discharge of urine and is independent of the musculature of the prostate. The bulk of the gland tissues is collected in the lateral lobes. The posterior commissure is chiefly muscular but contains a few glands.

"Enlargement of the prostate is due to the development of nodules in the substance of the original gland. Each nodule is made up of newly formed glands. As these nodules develop, they compress the original glandular substance which undergoes a pressure atrophy. The enlargement may affect one or both lalteral lobes. As these adenomas increase in size, the urethra, which is fixed anteriorly to the symphysis, is stretched backward so as to assume the form of a narrow slit. The urethra may actually become larger than normal as a result of this change. The increase in the bulk of the lateral lobes displaces the posterior half of the ring of the sphincter upwards, so as to form a transverse muscular fold behind the vesical orifice. This may act as a valve.

"In other cases there appears alone, or in association with the enlargement of the lateral lobes, a pear shaped mass of glandular tissue, which springs up inside of the sphincter and, lifting the floor of the trigone, projects upward into the bladder. This is the hypertrophied midlobe and seems to arise from hyperplasia of the small group of glands which lie in the posterior commissure and extends through the vesical orifice in front of the posterior half of the sphincter. This adenoma frequently attains great size.

"When the enlargement of the prostate is confined to the lateral lobes, there may be no interference with urination. When an adenoma develops in the posterior commissure, extending as it does through the sphincter, it acts as a conical plug, closing the urethral orifice. Also, the stretching of the sphincter from its presence often produces incontinence of urine."

In operating in either of these two types, we remove the newly formed adenoma but we do not remove any of the prostate gland. The original prostatic tissue, compressed and atrophied, acts as a surgical capsule and the cleavage line we follow is between the adenoma and the true prostatic tissue. This explains the ease of separation, the smooth surface left after the enucleation and the quite uniformly satisfactory after results.

Fibrous contracture of the vesical neck. This is an inflammatory process instead of an overgrowth of glandular tissue. There is a deposit of fibrous tissue about the vesical orifice. This may occur in different parts of the prostate, in the internal sphincter or in the trigone.

If the process occurs in the prostate, a small sclerotic gland results. While this produces some narrowing of the urethra, it does not actually obstruct the passage of the urine.

If the fibrosis involves the vesical orifice, a definite contracture results. The sphincter muscle gradually is replaced by fibrous tissue and finally a complete stenosis may occur. This type of obstruction frequently occurs in young and middle-aged men. Beer reports a case in a man of twenty-nine.

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* Read before the North Pacific Surgical Association, Victoria, B. C., Dec. 3, 1927.

If the fibrosis does not affect the circumference of the vesical neck but localizes in the trigone, the posterior portion of the sphincter becomes hard, inelastic and is usually raised above the level of the bladder in the form of a ridge stretching across the trigone. This is the median or Mercier's bar.

Associated with the fibrotic changes at the vesical orifice one or more small adenomata may also form. Structurally these are identical with the large adenomas. They are intraurethral or subtrigonal and if present are a factor in the obstruction.

Usually surgical intervention is required in the cases developing a fibrous contracture of the vesical neck, and the poor results following prostatic surgery are practically always in this type of case.

It is not possible to remove a normal prostate without producing marked permanent damage to the surrounding tissue. It is more difficult to remove one that has undergone a fibrotic degeneration. Attempts to do so have uniformly resulted in stricture formation and frequently in contracted, inflamed bladders. Fortunately, while the sclerotic prostate interferes with urination, it does not cause actual obstruction and its removal is not necessary. If the fibrosis involves the vesical neck, the orifice becomes progressively smaller; urination becomes increasingly difficult and finally acute retention develops. In this type the obstruction must be removed.

When the bladder is opened a small dimple indicates the orifice and the examining finger feels a dense, inelastic band of fibrous tissue instead of the easily dilatable sphincter. With the bladder walls retracted one has a good view of the vesical neck and a large V of the fibrous ring can be easily removed. Enough tissue should be removed to insure the patency of the orifice. Frequently a small adenoma will also be found and this can be enucleated without damage to the surrounding tissues. We employ the same method when the process is limited to the posterior portion of the neck, the so-called median bar. This is the type of lesion in which the punch operation is frequently advised. Severe hemorrhage may follow the use of a punch and it is impossible to remove exactly the desired amount of tissue by this method.

Valves of the prostatic urethra. Rarely folds of tissue are present in the prostatic urethra which offer opposition to the passage of the urine. These are of congenital origin and the most common type run from the verumontanum to the sides of the vesical neck. The passage of an instrument presses them against the floor of the urethra, but during micturition they fill with urine and, acting as valves, more or less completely obstruct the urethra. The obstruction can be relieved by cutting a section from each fold. Unfortunately, the condition is not usually recognized before the kidneys have been irreparably damaged.

Carcinoma of the prostate. Our knowledge of the anatomy of the prostate dates from the work of Tandler and Zuckerkandl. They demonstrated that behind the lateral masses and commissure there is another lobe, the posterior. This lobe is an independent structure. Its tubules originate from the urethral floor below the openings of the ejaculatory ducts, and the ducts themselves pass upward between it and the prostate proper. It is separated from the lateral masses by a fibrous capsule. Its glandular elements function in infancy but undergo atrophy early in life. The late T. J. Geraghty established the fact that carcinoma rarely or never begins in any part of the prostate except the posterior lobe. Limited by the fibrous capsule of this lobe anteriorly and the fascia of Denonvilliers posteriorly, a carcinoma extends upward along the line of the ejaculatory ducts toward the seminal vesicles.

The posterior lobe is left intact in the removal of adenoma of the prostate. Young's radical prostatectomy is the only surgical procedure which includes the actual site of the neoplasm. It removes the posterior lobe, the ejaculatory ducts, and the seminal vesicles as well as the glandular portion of the prostate. It is not often that the neoplasm can be diagnosed early enough to make this extensive operation justifiable.

Carcinoma of the prostate develops for a long time without producing obstruction to the passage of the urine. Frequently a patient has a carcinoma of the posterior lobe producing no obstruction, and adenoma in the glandular portion of the prostate producing marked obstruction. In such a case the removal of the adenoma will give the patient a considerable period of comfort before the neoplasm itself causes obstruction.

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THE USE OF LIPIODOL AS A DIAGNOSTIC AID IN GYNECOLOGY *

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Any safe method that will tend toward exactness in diagnosis, particularly in gynecologic diagnosis, should be welcome. The use of a fluid contrast substance injected into the uterus and tubes makes it possible to visualize these cavities with the x-ray. Iodized oil is probably the best opaque medium for this use. The preparations obtained at the present time, such as lipiodol, iodipin or iodunbrin, are practically the same, ocnsisting of vegetable oil combined chemically with about 40 per cent of iodine in weight.

Sicard and Forestier made over five thousand injections of lipiodol in various parts of the body and never observed any bad effects. I do not know of any untoward effects following its use. The technic of the injection as a gynecologic procedure is simple, but one can easily see that, due to the small amount of experience of any one, considerable difficulty will be met, and much pioneering will be necessary to develop a technic in reading the skiagrams. One cannot help but be mindful of the difficulties and pitfalls encountered by the pioneers in lung, kidney, stomach and intestinal roentgenologic visualization. I wish to add to the literature on this subject the results of the injection of iodized oil in eighty patients. †

TECHNIC OF INJECTIONS

It is needless to say that in the injection of iodized oil into the uterus and tubes, one should exercise the principles of strict aseptic precaution. The patient should receive an enema and empty the bladder prior to the injection, although this is not absolutely necessary, and many of my patients did not receive this attention. The patient is then placed in the lithotomy position on the Buckey diaphragm on the x-ray table with the film in situ. A bivalve speculum is inserted into the vagina and the cervix is exposed.

The vagina and cervix are wiped carefully of mucus and the cervix and the external os are painted with tincture of iodine. The anterior lip of the cervix is then grasped with a volsella, and a sound is introduced into the uterus to determine the direction of the uterine cavity and its depth. (The larger the uterine cavity, the more oil is required.)

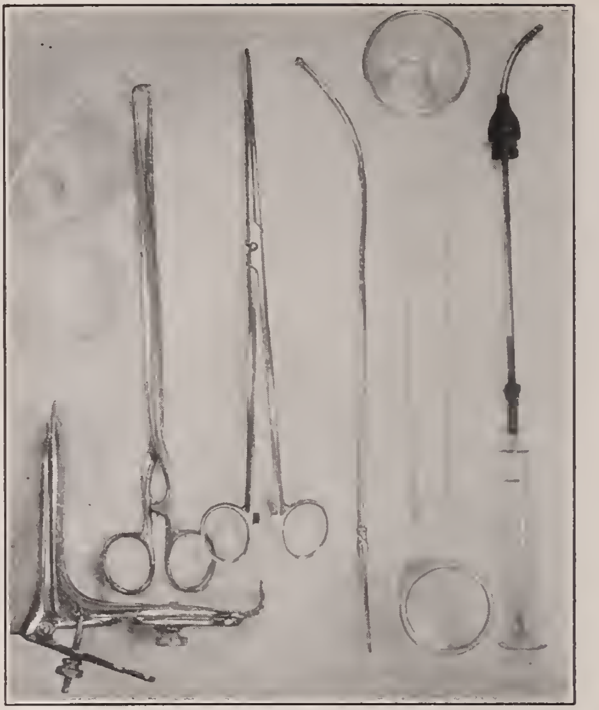

Fig. 1. Instruments used in the injection of iodized oil. Note Keyes-Ultzman cannula, with rubber tip attached and locked to syringe.

For injecting the oil, a modified Keyes-Ultzman urethral cannula with a rubber tip attached is used (fig. 1). A syringe containing approximately 20 c.c. of the oil is locked to the cannula by means of a bayonet attachment. The cannula is then inserted into the uterine cavity as per the direction made out by the sound, so that the rubber tip actually plugs the external os and acts as a cork. If the oil should be too viscous, warming will make it flow more easily. At this point traction on the volsella, accompanied by pressure on the cannula, will make a tight fit at the external os, and prevent leakage through it. The oil is then injected slowly and carefully until approximately 3 c.c. have been injected.

At this time the patient will experience light cramps, due to uterine contraction. After a pause of a few seconds, more oil can be injected. The amount of oil injected is variable, depending, first, on the size of the uterine cavity; and, second, on the amount of resistance felt. (A large or deep uterine cavity will hold more than 10 c.c. of the oil and a small uterine cavity with the cornual ends of the tubes obstructed will offer marked resistance to over 5 c.c.) From 5 to 8 c.c. of the oil will

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* Read before the Fifty-third Annual Meeting of the Oregon State Medical Society, Salem, Ore., Sept. 3, 1927.

† Lipiodol and iodipin were used.

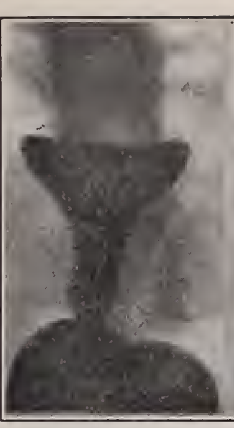

Fig. 2.

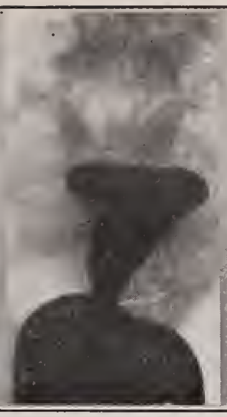

Fig. 3.

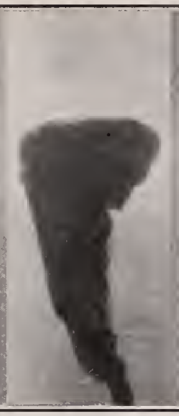

Fig. 4.

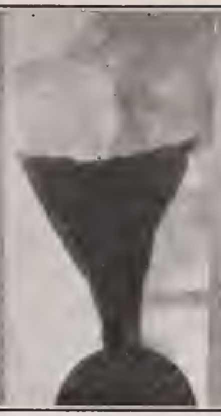

Fig. 5.

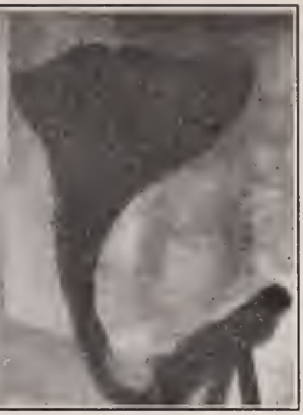

Fig. 6.

Fig. 2. Normal uterine cavity with occluded tubes. The heavy dark shadow in lower center is the bivalve speculum.

Fig. 3. Normal uterine cavity with occluded tubes. The portion of the tube passing through the uterine cornua is not visible.

Fig. 4. Elongated uterine cavity. The right tube had been removed in this patient, and the remaining tube is occluded.

Fig. 5. Normal uterine cavity showing portions of cornual ends of tubes.

Fig. 6. Cavity of large subinvoluted uterus. A rubber catheter instead of the cannula was used in this case, and the leakage from the external os is shown in lower center.

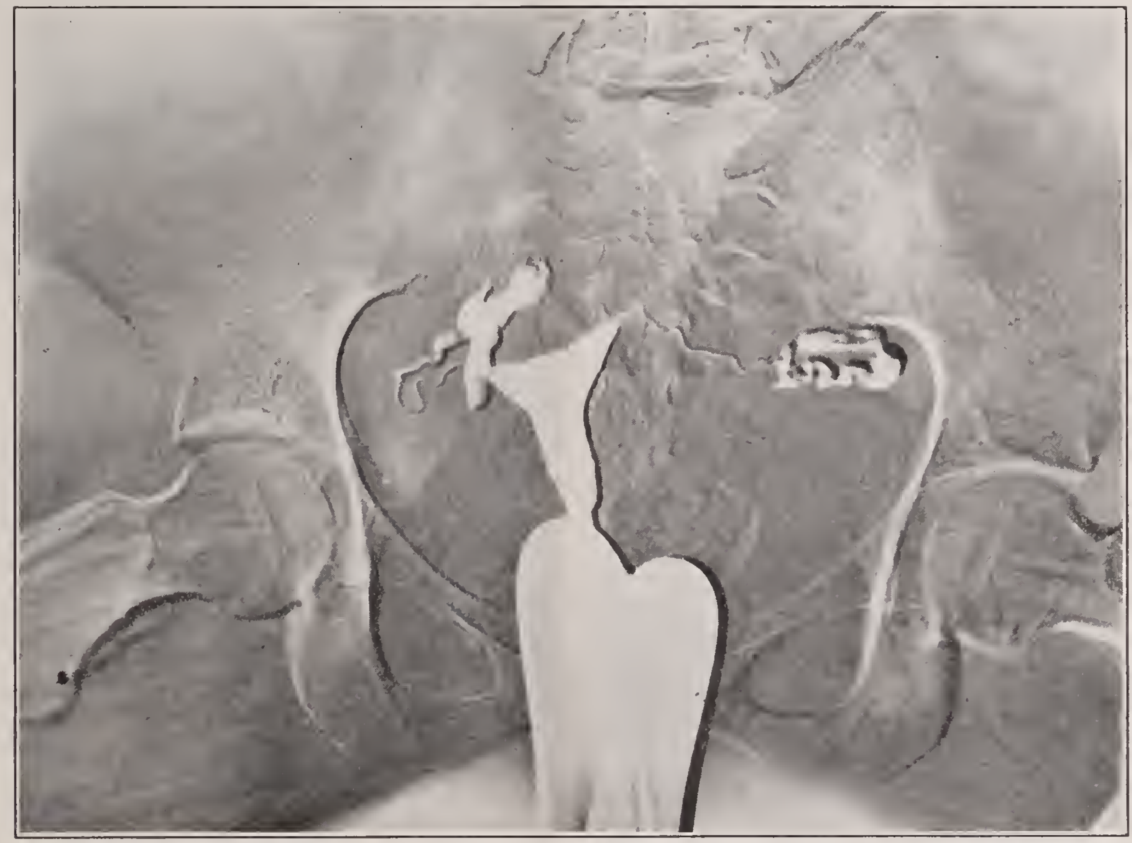

Fig. 7. Normal uterine and tubal cavities showing leakage through the fimbriated ends of the tubes. (This radiogram was made by slightly offsetting a positive and negative film and printing from this offset.)

fill the average uterus and tubes. When one estimates that the uterus and tubes are filled, the signal is given and, with the instruments in position as before stated, the flash is made. The volsella and the cannula are then removed. As there will be an outpouring of the oil from the uterus, the vagina should be wiped out and the speculum removed.

Duing preparation of the patient and the injection of the lipiodol she is apt to become apprehensive

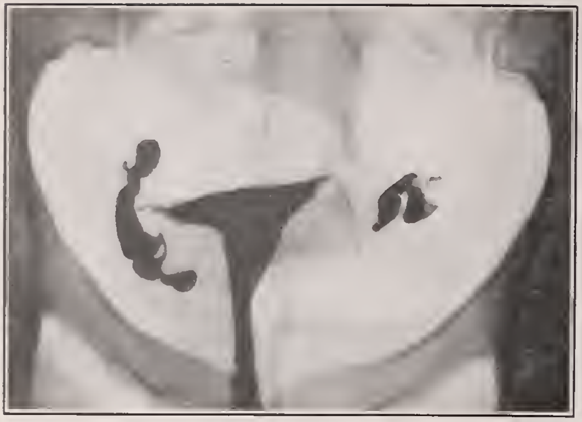

Fig. 8. Normal uterine and tubal cavities showing leakage through the fimbriated ends of the tubes.

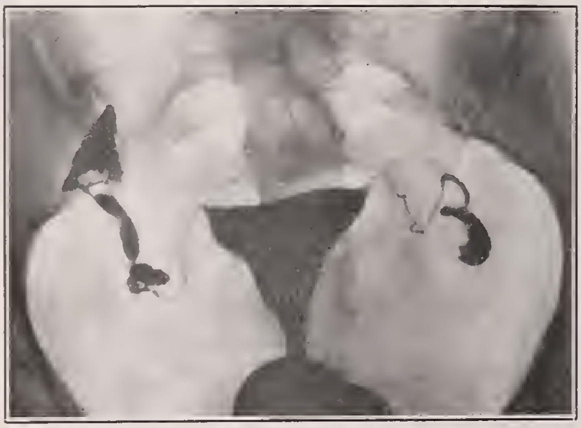

Fig. 10. Normal uterine and tubal cavities showing closed or clubbed left tube and leakage through the fimbriated end of right tube.

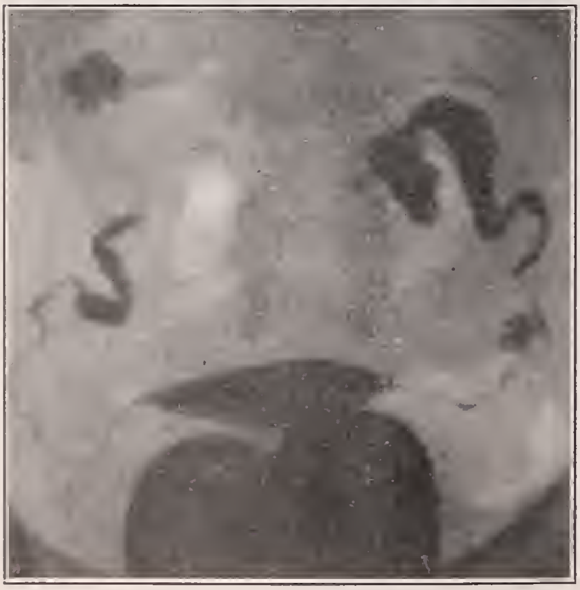

Fig. 12. The uterus in anteflexion. Both tubes are well-filled, showing fimbriated ends swollen and everted. This case proved to be one of acute gonorrheal salpingitis. At operation the tubes were acutely inflamed, the fimbriated ends were swollen and open and pus could be squeezed from them. Both tubes and a portion of the fundus of the uterus were removed (Bell-Beuttner operation). The wound was closed without drainage, patient made an uneventful recovery and left the hospital in fourteen days.

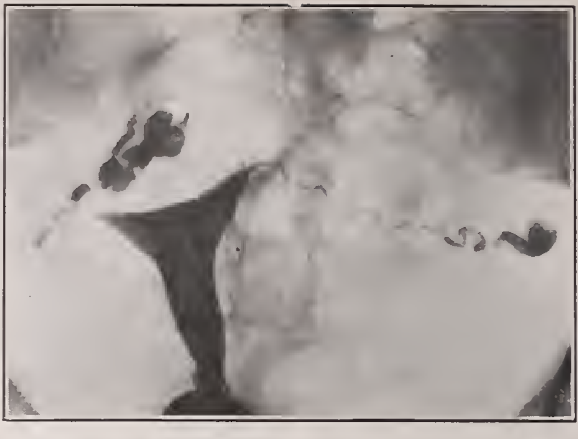

Fig. 9. Normal uterine and tubal cavities showing closed or clubbed left tube and leakage through the fimbriated end of right tube.

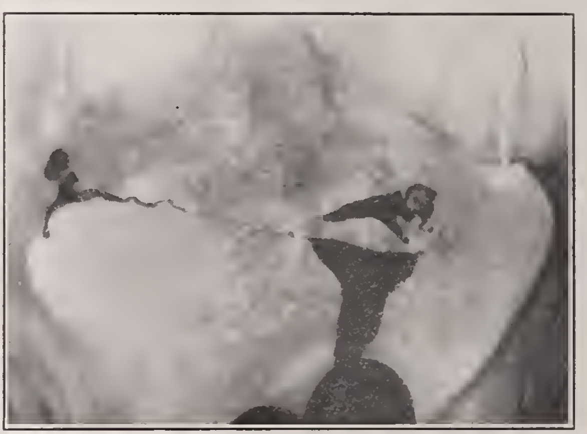

Fig. 11. Infantile uterus and normal tubes showing leakage through both fimbriated ends.

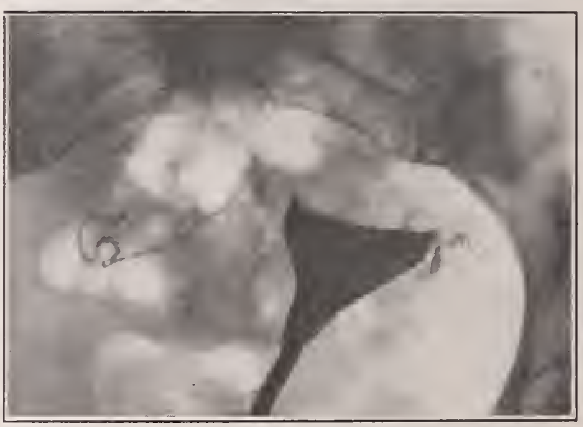

Fig. 13. Chronic bilateral salpingitis. Note the absence of dilatation of the distal ends of the tubes (Bell-Beuttner operation). The wound was closed without drainage, patient made an uneventful recovery and left the hospital in fourteen days.

and fear impending pain; for this reason it is wise to explain in detail just what is to be done and in what manner the picture is to be taken. Warning should be given that slight uterine cramps will be felt and that any movement on her part after the procedure has started will necessitate an additional

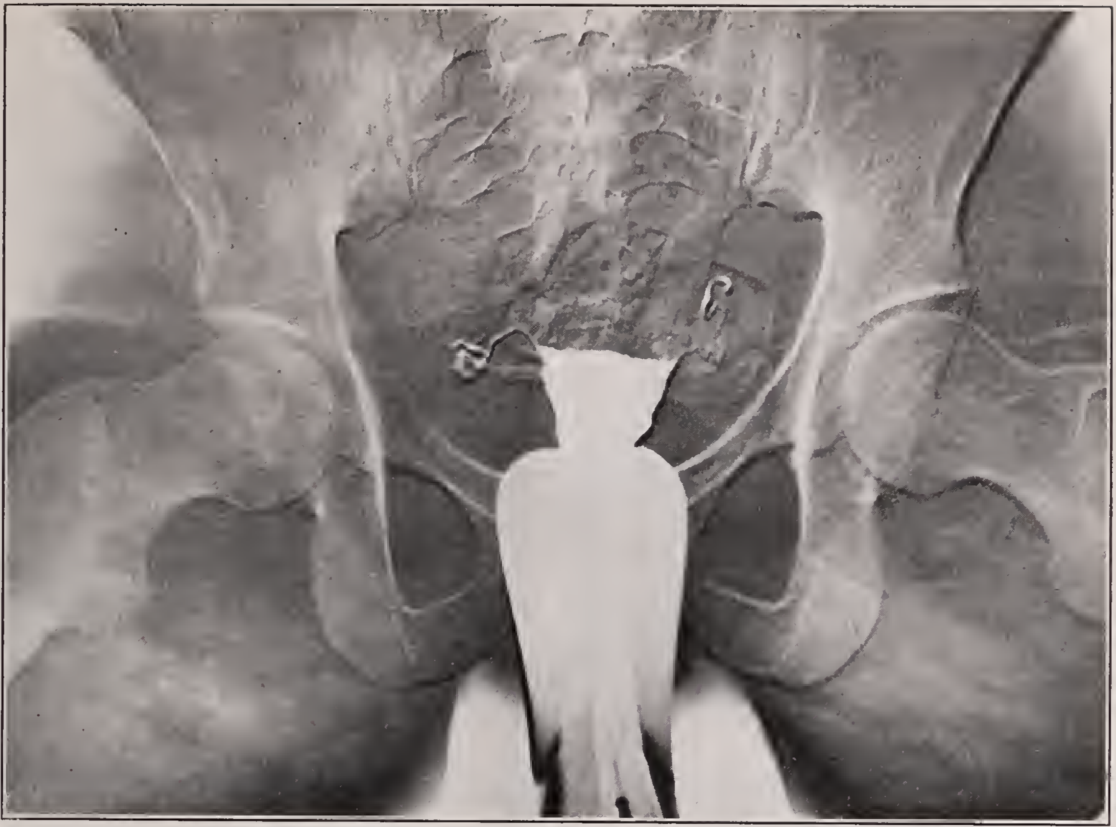

Fig. 14. Chronic bilateral salpingitis.

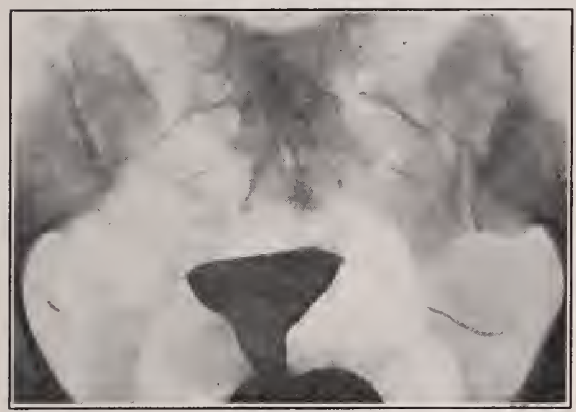

Fig. 15. Chronic bilateral salpingitis.

injection. Gentle admonition is wise before grasping the cervix with the tenaculum and again when the uterine sound is passed and the cannula is inserted. After 3 c.c. of the oil has been injected it is well to ask concerning the uterine cramps and to give assurance that they will soon pass off. With the aid of a good light and accessible instruments the entire injection can be made, together with the taking of the skiagraph in less than two minutes from the introduction to the removal of the speculum.

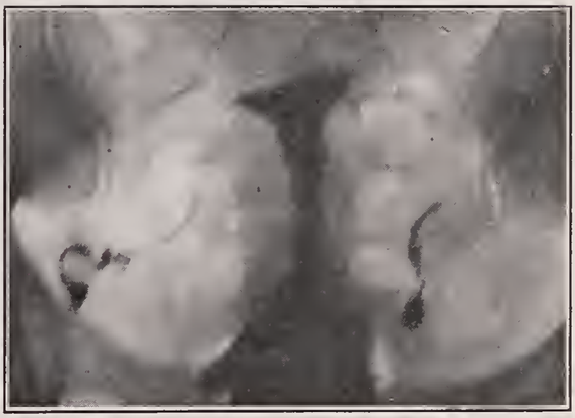

Fig. 15. This patient had the classic signs of ectopic pregnancy: exposure, missed period, uterine bleeding and a doughy mass in the right pelvis. The ovary had been removed from the right side at a previous operation. The injection of lipiodol showed both tubes filled to their distal ends, ruling out the diagnosis of ectopic pregnancy. A diagnosis of intraligamentary cyst was then made and proven at operation.

In my experience it has been only the neurotic subjects who have suffered any inconvenience during or following the use of this diagnostic maneuver. There has been a rise of temperature in only one case and this was 101 degrees for twelve hours.

Approximately 50 per cent of these patients were operated on within from two hours to five days

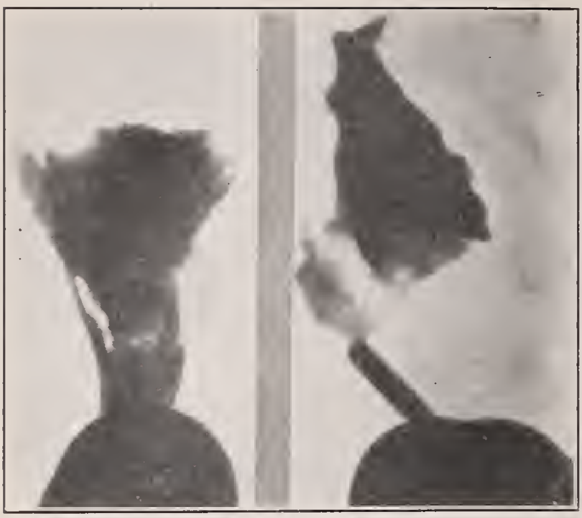

Fig. 17. Fig. 18.

Fig. 17. Visualization of uterine debris in a case of incompletable abortion.

Fig. 18. Pregnancy of six weeks duration. This patient was sent from the neurologic clinic with a diagnosis of epilepsy and a request that she have a prophylactic abortion. This was done by way of an hysterotomy. The uterus was closed and the tubes were amputated at their cornual ends and these were buried in the folds of the broad ligaments for sterilization. The patient made an uneventful recovery and left the hospital in twelve days.

following the injection and in no case was any evidence of peritoneal irritation found. In three cases, following Bell-Beuttner operations, lipiodol was seen in the pelvis with the radiogram after operation. I presume this had leaked out during the excision of the fundus of the uterus and had become incorporated in the incisional enclosure.

Eighty cases have offered definite evidence that the use of lipiodol is a gynecologic diagnostic aid:

1. In visualizing the uterine cavity.
2. In visualizing the tubal cavities and in locating obstructions therein.
3. In chronic uterine subinvolution.
4. In intrauterine tumors.
5. In outlining large tumors in the vagina.
6. In differentiating between ectopic pregnancy and intraligamentary cysts of the same side.
7. In demonstrating normal tubes.
8. In demonstrating club tubes.
9. In visualizing an infantile uterus.
10. In showing that a large pelvic abscess is not tubal in origin.

I also feel that the time will come when the technic of reading the plates will have reached the point where one can make differential diagnoses between normal, chronically and acutely infected tubes, and those that are tuberculous.

545 Medical Arts Building.

PROLAPSE FOLLOWING HYSTERECTOMY

A NEW TECHNIC FOR ITS REPAIR *

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The condition of prolapse of all or part of the genital tract is growing slowly less common, due to better obstetrics and better surgery. It is, however, such a disabling condition that anything which contributes to success in its treatment is worth consideration. The resume of the factors involved in the normal support of the uterus and in support of the vaginal vault after hysterectomy may be brief, being so familiar to all surgeons. There are normally four factors, (1) the pelvic floor, (2) the ligaments and attachments of the uterus, and (3) the uterus itself which, by (4) the intraabdominal pressure, is held against the symphysis pubis.

When a third degree prolapse has occurred, or the uterus is removed for other conditions, the supports are reduced to two; the pelvic floor, and the so-called ligaments. Intraabdominal pressure is now acting to displace rather than retain normal positions. A great deal more will, therefore, depend upon the perfect condition of the two remaining supports, and there should never be any excuse for neglecting perineal repair if needed. In fact, this will often prove sufficient, even if the ligamentous fascial planes above are weak, or if only a partially satisfactory repair of these is possible.

The fascial planes referred to consist of the uterolateral or cardinal ligaments, the uterosacral ligaments, and the uteropubic fascia. Of these the uterolateral ligaments are by far the most important, being usually fairly dense. After an uncomplicated hysterectomy these fibres are drawn together about the cervical stump or vaginal vault, failure being expected only in radical operations for malignant neoplasms. In such cases other tissues, such as the round ligaments, may be used to fill the gap. The typical operation is an apposition of the broad ligaments, being careful to get the denser fibres of fascia in the base, suturing them, together with the round and uterosacral ligaments into the opening in the pubic fascia, forming a firm diaphragm. W. J. Mayo reports using this type of closure successfully for many years, its necessity having been pointed out many years ago.

But there will occur cases of prolapse which have delayed in applying for treatment, in which there is

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

very great thinning of all important structures, especially the lateral ligaments, so that such a repair is weak at best. In these cases, especially after hysterectomy, some form of attachment to the anterior abdominal wall has been used. These methods include fixation of the cervical stump by implanting it in the muscle (rectus), or the round ligaments may be fixed to the stump and then fastened through the rectus muscle. Crile's often quoted method involves a splitting of the vaginal vault in the median line with excision of the mucosa from the part to be used. These fascial flaps are brought from each side through the corresponding rectus muscle, and stitched together outside. Another alternative is to obliterate or nearly obliterate the vagina, as suggested by Edebohls, building up a heavy perineum by closing the tissue from each side, but a normal vagina is important to a middle aged woman, and this operation may meet with objection in the older. The other operations are far from ideal because of the distortion caused, and at the very least, opening the abdomen with the subsequent repairs leads to frequent adhesions, and there is always more risk accompanying a major operation.

The operation to be described overcomes all of these objections, and changes the procedure to a minor one. It meets the requirements of a permanent repair, while leaving the vagina. Although designed to meet the need of extreme cases, not often met but hitherto very hard to repair, it may be used with a vaginal hysterectomy for prolapse, or in the average case of prolapse after hysterectomy, where a poor repair of the floor was obtained. It is unnecessary to open the abdomen at all, which is a not inconsiderable advantage.

Briefly, the operation is a fixation of the stump of the cervix or vaginal vault to the pelvic wall on one side, or to the dense fascia near it. If a hysterectomy has been performed previously, and especially in the presence of the usually accompanying cystocele, a median incision is made through the mucosa of the anterior wall of the vagina, and extended to the apex. The mucosa is separated for a short distance to both sides, and by palpation the side located which has the best body of fascia at the base of the broad ligament. This is the side to which the stump will be fixed unless bimanual palpation has shown that the pelvic floor is much heavier on one side of the vault than the other. If there is a difference, the apex is carried to the weaker side, leaving the heavier wall for better support of the pelvis.

Extend the incision laterally to the side chosen, and dissect upward and outward into the base of the broad ligament, using blunt dissection by spreading scissors in the cleavage plane. If a stump of the cervix is present, the mucosa is cleared from the side, giving a raw area to unite when attached. The mucosa is removed from the bladder far enough to allow easy access to the side.

In cases where the vault is very thin the ureter is close to the operative field, but if dissection is done bluntly, it is nearly impossible to injure it. Since the stump is brought across below it, making a broad fold in the peritoneum parallel to the ureter, it is impossible to kink it. The dissection into the broad ligaments extends to the side wall or the retracted portion of the cardinal ligament, reaching it just below the white line of the pelvis. Two hard chromic sutures are passed shallowly into the pelvic wall with care to allow no areolar tissue to interpose, and then through the side of the stump, and tied securely.

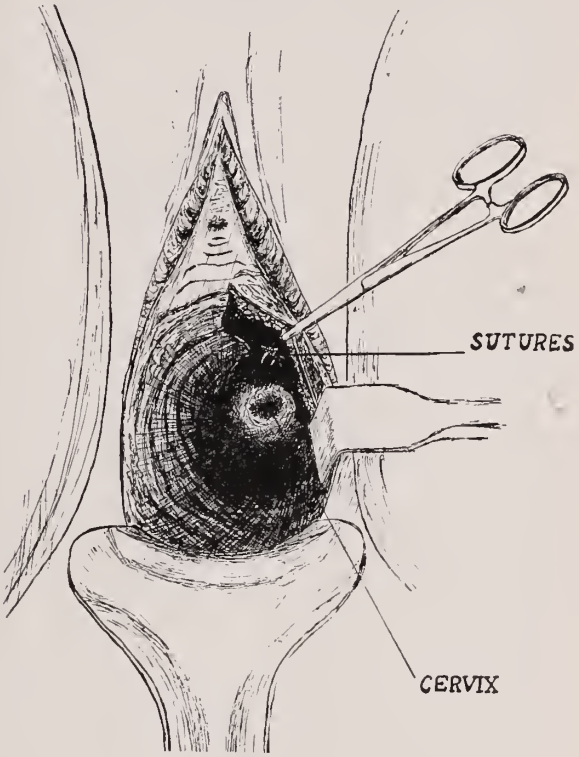

Fig. 1.

This carries the stump over toward the side wall, the exact change of position being determined by the thickness of the fascia and breadth of the pelvis, but it is surprisingly small in amount. The change of position is much less than the distortion in abdominal wall fixation. In the case reported it

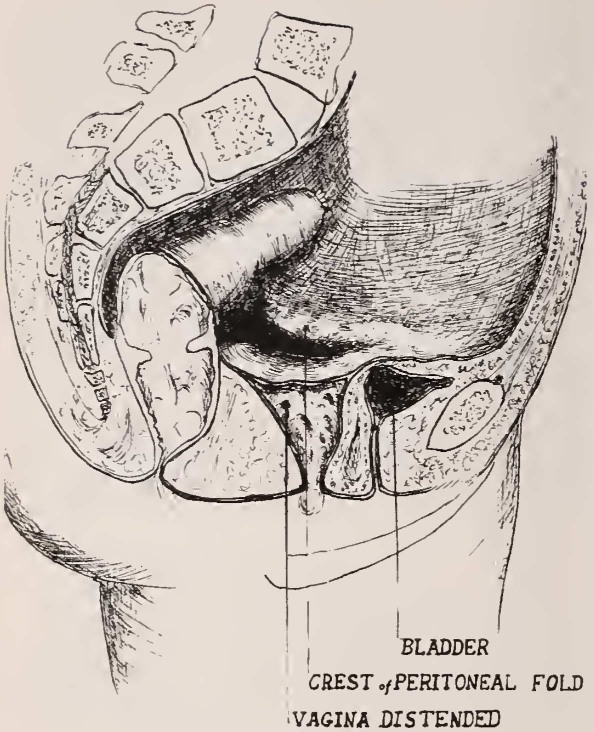

Fig. 2.

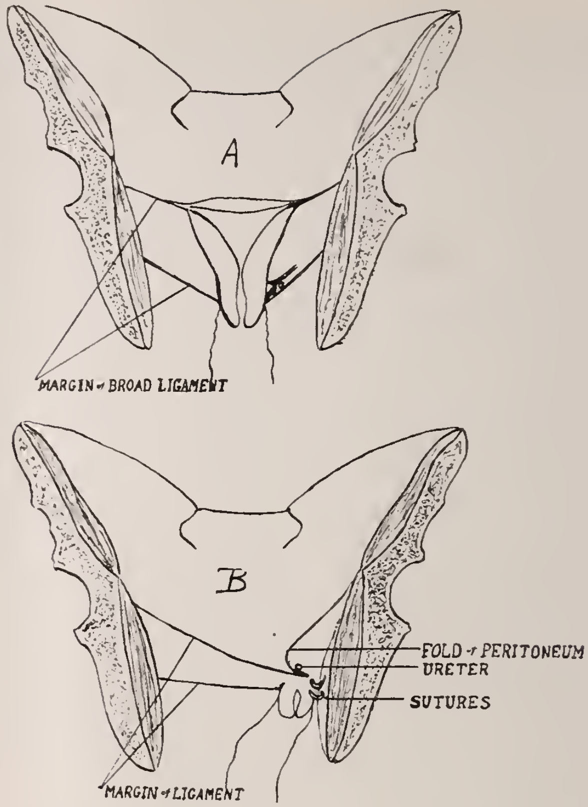

Fig. 3.

seemed to be about one and one-half inches, and was entirely satisfactory, all symptoms being entirely relieved.

The first illustration (fig. 1) shows the cervix carried to the side wall. The flap of mucosa, which is shown held out of the way by a clamp, is adjusted to fit the margin of the raw area on the cervix, and any cystocele is repaired at the same time. Figure 2, a section through the median plane, shows the broad fold of peritoneum on the side to which the cervix is moved. Figure 3 is a schematic cross section, designed to show the alteration from normal conditions, and how the weight of the abdominal contents is thrown toward the firmly anchored cervix. It also shows how the ureter is pushed upward to avoid kinking as the cervix is carried below it.

CASE REPORT

Mrs. A. H. was admitted to the hospital, complaining of pressure and severe irritation where the prolapsing part presented at the orifice. She had had an operation for prolapse four years previously, which is often the story. The same condition had slowly returned until for three months it had been so bad that she had to seek another operation.

Examination revealed inflamed tissue presenting at the orifice of the vagina, which consisted of the remnant of cervix which had been cored out until a bare shell remained, and the vaginal wall. The tissue at the apex of the vagina to each side was very thin. There was moderate cystocele of the lower wall, but the condition was chiefly a telescoping of the apex through the vagina, due to failure of the pelvic floor under pressure of the abdominal contents. The cystocele required but little repair after the prolapse was corrected.

On June 9, 1925 the operation was performed as described above, and also a better perineal body was made without encroaching on the size of the vagina. Recovery was uneventful.

Some months later the patient reported perfect health with no local symptoms. The stump was found to be fixed to the pelvic wall with very little motion possible, and it was difficult to imagine its giving way.

Last spring I did not locate her until after she had been to the hospital and left again. The hospital report shows she was there on May 24 for influenza, and had no return at all of her previous trouble. This was two years after the operation, and after this length of time the success of the operation seems assured.

Conclusion. In some cases of prolapse, a fixation as described, of the stump of the cervix or the vaginal vault to the pelvic wall, is simpler to perform and more satisfactory than previous operations which require opening the abdomen.

CRANIORRHACHISCHISIS

ITS CLINICAL AND MORPHOLOGIC ASPECTS *

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In the course of a series of obstetric deliveries, there will be found a certain small percentage of monstrosities, of which by far the largest number are single monsters coming under the group craniorrhachischisis. At the Minneapolis General Hospital, from January 1, 1923, to January 1, 1928, there were 5911 obstetric deliveries. In this series there were 11 monsters, coming under this classification. This represents 0.2 per cent of the total deliveries and 7.5 per cent of the total stillbirths during this time. The 11 monsters were divided as follows: anencephalus, 8 cases; exencephalus, 1 case; meningoencephalocele, 2 cases. Figure 1 shows the clincal characteristics of these 11 cases.

Before proceeding further, the following brief definitions of terms used will be considered: Craniorrhachischisis, a congenital fissure of the cranium and spinal column; acranius, absence of the cranium; exencephalus, the presence of the brain on the outside of the skull; meningoencephalocele, a hernial protrusion of the brain and meninges through an aperture in the skull.

We have successfully diagnosed two cases of anencephalus and one case of exencephalus by x-ray findings. The clinical course, mechanism of labor and delivery of these two types are quite characteristic. Hydramnios is practically always present, the increase of fluid occurring quite suddenly from two to three weeks prior to the onset of labor, which is usually premature at about the seventh or eighth month. A case seen in labor nearly always shows a marked degree of hydramnios, inability to palpate the fetal parts by abdominal methods, and absence or feebly beating fetal heart tones.

These findings should prompt the obstetrician to do an x-ray examination, at which time the characteristic findings of anencephalus will be found and the positive diagnosis be made before delivery. Three of this series were successfully diagnosed by this means, as is shown in figures 2 and 3. The characteristic x-ray findings of anencephalus are a complete absence of the cranial vault, with a marked distortion of the bony contour of the head. The findings of exencephalus are similar and, in addition, the soft tissues of the head are clearly demonstrated and are considerably larger than the bony structure.

Labor is not necessarily prolonged. In the present series it averaged twelve to thirteen hours with a second stage of from one-half to two hours. The membranes usually rupture early in the second stage, there being a profuse gush of amniotic fluid averaging from four to seven quarts. At this time either a soft, spongy mass which is the face can be palpated by rectal examination or a footling presentation occurs. Delivery is usually spontaneous, if there is a face presentation, and an easy extraction if a footling. During the process of breech extraction the operator has the sensation of having "pulled the head off," until he recognizes that he is dealing with a monster. The malformed fetus is usually stillborn, or is born with a feebly beating heart, but no respirations are established and it dies a few minutes later as a postpartum stillbirth.

We have distinguished three types of monsters

Fig. 1. Monsters of General Hospital Series,

Case No.	Para	Months of Gestaton	Wassermann	Hydramnios	Toxemia	Presentation	Method of Delivery	Results		Sex	Wt. in Grms	Type of Monster	Remarks
								Mother	Child				
1	1	7½		*	0	Brow	Spont.	L.	S.B.	F	920	Anencephalus	
2	6	7½	Neg.	*	0	Face	Spont.	L.	S.B.	M	1280	Anencephalus	
3	3	9	Neg.	*	0	Cephalic	Spont.	L.	S.B.	F	1800	Anencephalus	X-ray diagnosis
4	4	8		*	0	Cephalic	Precipitate	L.	S.B.	F	1550	Anencephalus	
5	1	7	Neg.	*	0	Face	Spont.	L.	S.B.	F	1070	Anencephalus	First of twins
6	1	8	Neg.	*	0	Face	Spont.	L.	S.B.	F	1600	Anencephalus	X-ray diagnosis
7	2	7	Neg.	*	0	Footling	Extraction	L.	S.B.	F	880	Anencephalus	
8	3	6	Neg.	*	0	Face	Spont.	L.	S.B.	F		Anencephalus	
9	1	9	Neg.	*	0	Footling	Extraction	L.	S.B.	F	2095	Exencephalus	X-ray diagnosis
10	3	9	Neg.	0	0	Occiput	Spont.	L.	Died	F	3190	Meningo-encephalocele	Lived 8 days
11	3	8	Neg.	0	0	Footling	Extraction	L.	S.B.	F	1300	Meningo-encephalocele	

* Present. O Absent. L. Living. S.B. Stillborn

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* Read before the Minnesota Pathological Society, Minneapolis, Minn., January 17, 1928.

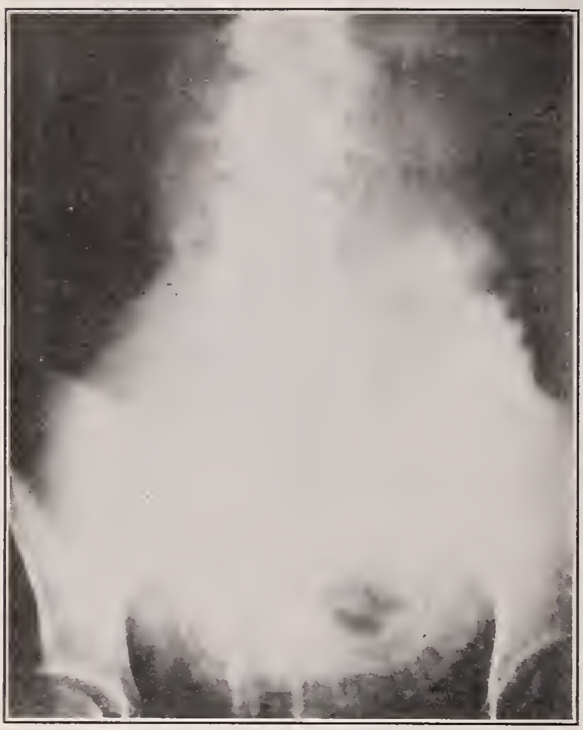

Fig. 2. X-ray diagnosis of anencephalus; complete absence of cranial bones.

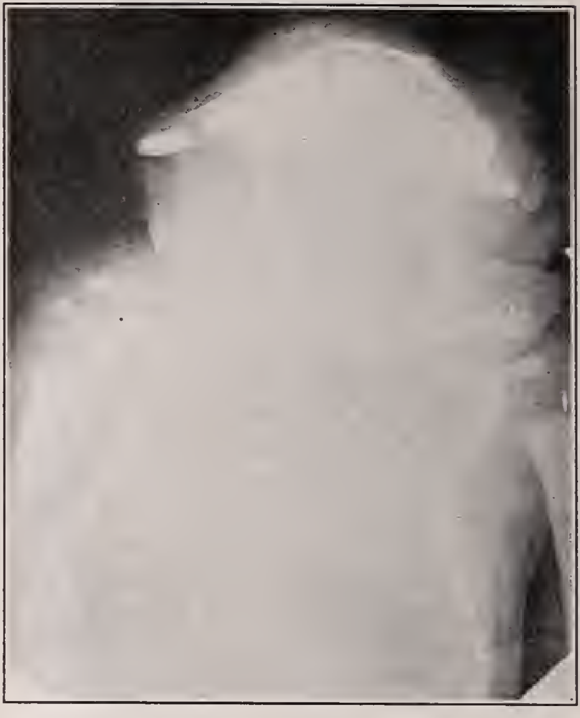

Fig. 3. Radiogram of an anencephalic monster.

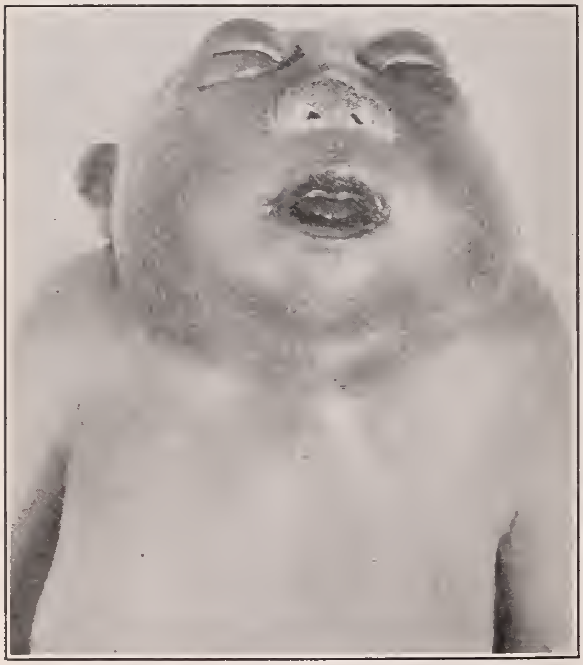

Fig. 4. Frog-faced features of anencephalus.

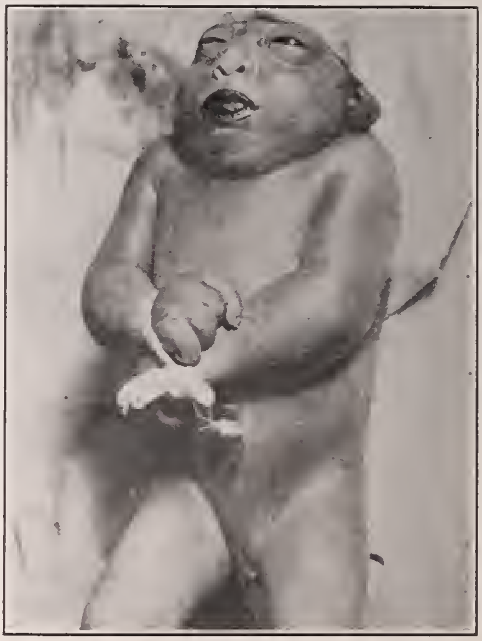

Fig. 5. Anencephalus, anterior view.

as follows: first, anencephalus acranius, five in this series; second, anencephalus craniorrhachischisis, three in this series; and third, exencephalus acranius, one case in this series.

The appearance of these monsters is quite characteristic, namely, the typical frog face features, as shown in figures 4 and 5. These are exophthalmos, prominent supraorbital ridges, large protruding tongue, absence of neck, the ears thickened and coming off the line of union between the head and shoulders and absence of cranial vault, there usually being a complete absence of the frontal, parietal and occipital bones. The abdomen is at the level of the thorax, the fetus being well nourished and plump with hypertrophied upper extremities. The

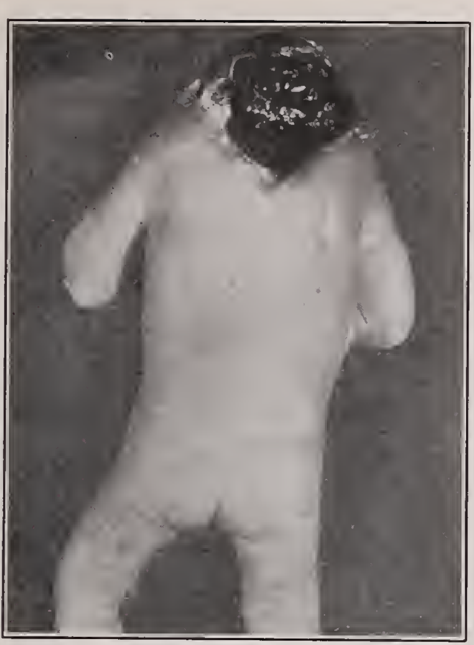

Fig. 6. Anencephalus, posterior view.

scalp, calvarium, dura and dural sinuses are all missing. The fossa of the skull is flattened, there often being a soft tumor, attached to the base of the skull in the region of the normal occipital bone, which is the rudimentary brain. There is an absence of the normal cerebrum, cerebellum and medulla. The dorsal ridges of the upper cervical vertebra usually fail to fuse and there is found a triangular opening in the neck which is continuous with the opening in the skull (fig. 6). This defect may extend down the entire length of the spine as far as the sacrum. In anencephalus acranius there is only the defect in the cranium and in the spine. In exencephalus there is an absence of the cranium, with the entire brain being found on the outside of the cranium.

At autopsy the other most characteristic finding is a change in the adrenals, there being either a complete absence of the gland or a hypoplasia. The adrenal gland of these cases averages from 0.7 to 1.5 gm. in weight; in two cases they were entirely absent. Other associated but not constant findings are horseshoe kidneys, congenital hydronephrosis, hydroureters, double ureters, hypoplasia of lungs, diaphragmatic hernia, ventral and umbilical hernia, accessory spleens, meningocele and spina bifida. The weight of these fetuses is less than the average normal fetus of the same age, with a lessened crown-heel and crown-rump measurement.

In addition to the nine cases of this series we have forty-two cases from the Department of Obstetrics and Pathology of the University of Minnesota from F. L. Adair's series of fetal and newly-born autopsies in a similar five year period. In the nine cases of the General Hospital series there are certain clinical characteristics, namely, the presence of hydramnios, the absence of toxemia and a negative Wassermann.

There were two cases of twins, one in the General Hospital series and one in the University series. In one case the first twin was a monster, the second being normal and living. In the second case the first twin was normal and living, and the second twin was a monster. Both cases were biovular twins.

In two of the University series there had been previous monsters. The first case was para-II with a six months premature monster, type unknown, in her first pregnancy. The second case was a para-VI with four living children, an eight months premature stillborn monster with hydramnios having been born in the fourth pregnancy. The fifth pregnancy was normal and the present pregnancy resulted in an anencephalic monster.

Another type of monster of the craniorrhachischisis group is the meningoencephalocele type. This group is less frequent than anencephalus and will be considered for purposes of comparison. Clinically these cases show absence of hydramnios; the presentation may be either an occiput or footling. Labor is usually premature with a stillborn fetus, but if at term the fetus may live. Cases 10 and 11 of figure 1 show the characteristics of the two cases

Fig. 7. Monsters of University Series.

HYDRAMNIOS		TOXEMIA		WASSERMANN	
Present	30 Cases	Present	2 Cases	Positive	1 Case
Absent	4 "	Absent	35 "	Negative	10 "
Not stated	8 "	Not stated	5 "	Not stated	31 "
PRESENTATION		**METHOD OF DELIVERY**		**TYPE OF MONSTER**	
Cephalic	15 Cases	Spontaneous	28 Cases	Anencephalus craniorrhachischisis	27 Cases
Face	11 "	Extraction	4 "	Anencephalus acranius	14 "
Breech	2 "	Forceps	3 "	Exencephalus acranius	1 "
Footling	2 "	Version	2 "		
Shoulder	1 "				
Brow	1 "				

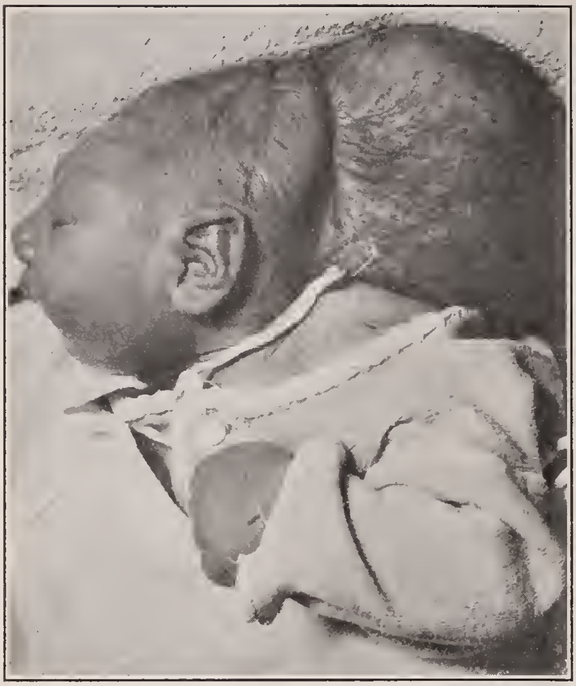

Fig. 8. Meningoencephalocele monster; lived eight days.

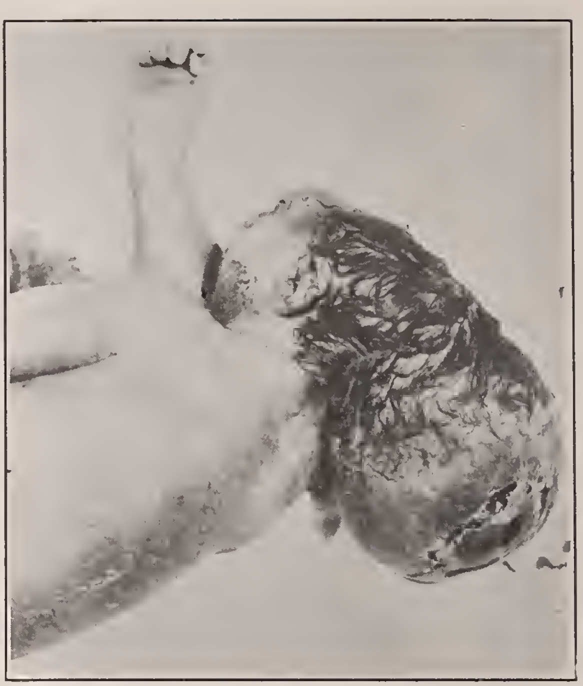

Fig. 9. Meningoencephalocele monster; stillborn.

of the hospital series. One case lived eight days (fig. 8). Figure 9 illustrates Case 11, a premature stillbirth. In the university series there were four cases, all stillborn. Of the six cases the sex relationship showed five females and one male, bearing a similar relationship to the anencephalus group.

The characteristic findings of the meningoencephalocele group are as follows: usually good general development and nutrition. The typical case shows posterior to the cranium as a peduncluated mass partially covered by hairy scalp, the outer two-thirds being devoid of hairy skin and covered by membranes and a very thin skin. The mass does not transmit light and is very firm. This mass apparently protrudes from the posterior fontanelle. The average measurements of the mass are 9–12 cm. in diameter.

On opening the scalp, the cranial bones are found firmly united except at the posterior fontanelle, from which the mass protrudes. The frontal, parietal and occipital bones are present, slightly smaller than normal, but with their usual membranous union of the suture lines. On opening the mass a defect can be found in the dura, through which the cerebrum protrudes, covered either by the piaarachnoid or embryonic tissue. The entire mass consists of cerebrum and is continuous with the brain tissue in the cranial cavity. The spinal cord is normal in these cases. There is an absence or hypoplasia of the adrenal glands with other associated anomalies, as found in the General Hospital series.

SUMMARY

Fifty-seven monsters in all are presented and grouped as follows: anencephalus acranius, 19 cases; anencephalus craniorrhachischisis, 30 cases; exencephalus acranius, 2 cases; and meningoencephalocele, 6 cases.

These present the following definite characteristics and clinical findings:

1. A definite sex relationship with a marked preponderance of females, 49 cases being females and 8 cases males.

2. The absence of the toxemias of pregnancy.

3. The absence of the spirochoctæ pallida, as is shown by the Levaditi stain in the tissues of the lung, liver and adrenals and the negative Wassermanns.

4. The presence of hydramnios in all but the meningoencephalocele group.

5. The preponderance of abnormal presentations with spontaneous and uncomplicated deliveries.

6. The characteristic findings of the face, cranium, spine and brain, as already described for each group.

7. The absence or hypoplasia of the adrenal glands in practically every case.

8. The ability to make a definite clinical and x-ray diagnosis of a monster before delivery.

ANOREXIA NERVOSA

HYPOGLYCEMIA OR HYPOADRENIA *

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Normally we are unconscious of the activities of our stomachs and only at regular intervals are we reminded by sensations in the epigastrium and esophagus of the necessity of taking foods. This is the sensation of hunger and, if this sensation is accompanied by a desire for certain foods, we might term it appetite. The periods of increased appetite are brought about by phases in the motor and secretory activities of the stomach and, in all probability, are in the last end caused by changes in the blood as by a lowering of the blood sugar level.

Anorexia is the reverse of appetite and is caused usually by a lack of gastric secretions, as in achylia accompanying pernicious anemia, cancer and degenerative gastritis, or it is caused by mental and nervous conditions associated with depressions. However, it is not uncommon to find achylia associated with an excellent appetite, as in gallbladder patients, or normal or even excessive acid conditions in cases of anorexia. Disturbances in the gustatory sensations may cause lack of desire for foods (ageusia).

At present we are mainly interested in that condition in which the nervous (mental) influences on the appetite and the gastric mechanism seem to be mostly at fault, or at least to be blamed. Very interesting is the fact that almost invariably the patient afflicted with this type of anorexia is found in surroundings which tend to increase his interest in himself. The neurotic, hysterical, neuropathic patient is pleased with the great interest his weeping friends and oversolicitous relatives take in his case, and listens with obvious satisfaction to the tales they never tire of relating as to how this or that quality of food distresses the poor victim, how they cannot understand how a person can possibly live through such suffering; they don't know what keeps the dear child alive, etc.

The patient, of course, is not going to take any chances with this, his glorious position in the limelight. He has a reputation to live up to, as Cameron puts it. In a number of my cases, reading of physical culture and certain diet books has gotten the patients interested in the abusive, outrageous and unscientific feeding to which humanity is being subjected. From this it seems that a certain mental makeup is the foundation upon which the clinical picture is built up.

The term anorexia nervosa was first used by Sir Wm. Gull in 1874 to denote a condition of disgust for food. The patient is irritable, restless, sleepless and obstinate and in the severe cases is in grave danger of his life. Gull considers the condition a nervous affliction, involving especially the vagus. Gradually the term anorexia nervosa has come to signify the loss of appetite in the hysterical.

The following description of the disease closely follows that given by Dercum in Sajou's Encyclopedia. Usually there is no organic cause for the loss in weight to be found. Melancholia can lead to absolute refusal of food but the picture of melancholia is usually readily distinguished from hysteria. The latter condition is characterized by the suggestibility and emotionalism of the hysterical. In neurasthenia there is rarely a loss of appetite; rather is the latter somewhat exaggerated, as is also the case in psychasthenic conditions. Real phobias as the cause of food refusal are not met with in hysteria. The anorexia becomes a symptom in this latter disease, the desire for food being eliminated from the consciousness of the patient in the same manner as the arm or leg is eliminated from his consciousness in hysterical paresis. We must also assume that hysterical, painful areas may develop in the gastrointestinal mucosa just as well as they develop on the surface, the same being true of other disturbances in the sensory, motor and secretory nerves, either in the form of inhibitions or stimulations.

Usually in severe cases of anorexia nervosa the other hysterical symptoms may become less prominent or even disappear, but always will the hysterical attitude of mind be present. The development of this condition is usually gradual, the appetite slowly and progressively diminishing to a point where food is finally refused or, if taken on persuasion, it is vomited. When perversion of taste is present, vomiting may be very persistent. In some cases, in which it is possible to persuade the patient to take some food, the appetite returns.

In another series of cases, the anorexia develops on the basis of a mild dyspepsia, as a feeling of fullness and gas after meals. Certain foods are promptly eliminated from the menus as being indigestible; then more and more are accused until there are very few left and these are usually those which are liked best and which are often found to be the real offenders; usually coffee, tea, sweets or fruits

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* Read before the Seattle Academy of Internal Medicine, January 30, 1928.

are the only articles taken. The patients then develop a fear and disgust of food. They develop areas of hysterical pain and hyperalgesia in the gastrointestinal tract and really suffer from food intake.

The writer has seen such patients develop hysterical distension immediately after meals, even after a small amount of water or milk, often reaching such degrees of ballooning, with rapid pulse and difficulty in breathing, that a stomach tube had to be inserted, through which the gas was expelled with great force. This aerophagia, however, usually does not reach such a degree but it is one of the most indulged-in pastimes of these patients to entertain their neighbors with unbelievably persistent belching. In time they restrict their diet more and more with resulting enormous emaciation.

In another series of cases, unhealthy ideas and foolish notions as to foods are the causative agents, such as food fads, fixed ideas as to the value of milk, eggs, etc., fear of being fat, desire to retain an active brain. These cases are especially difficult to take care of, as they do not seek the physician's aid, but are forcibly brought to him by friends or relatives when the degree of emaciation has reached such a stage as to thoroughly alarm them. Quite naturally the resenting, negativistic patient refuses to cooperate but rather puts forth all of his strength to resist the efforts of physician and nurse. These cases may go on to dementia praecox. We have seen food hidden in hot water bottles or in chambers in an endeavor to foil the attempts of the physician. Often this is persisted in until death and, in such cases as have been reported, autopsy has revealed no organic cause for the condition. In other cases foods are taken on the sly; then emaciation is absent or not very pronounced. Such cases are doubtless known to all of us and are quite common among religious fanatics.

Treatment. Provide isolation and removal from the baneful influence of friends, careful bathing in bed and light general massage with careful guard as to the remarks of the nurse lest she appear to display interest in the emaciation of the patient. Avoid massage of the abdomen for the same reason. We have used a modified Lenhart's ulcer diet, as it permits of a very gradual increase of the food quantity without arousing the suspicions of the patient. It is often necessary to dilute the milk or modify it as you would with a sick infant. Eventually rectal and nasal feeding must be resorted to. The patient *must* eat, as the taking of food over a certain period of time will restore the appetite and confidence in his ability to eat. Solids that must be chewed are often easier than fluids, coarse breads better than fine breads, as they produce more saliva. Foods must be served in an appetizing form and in dainty portions, giving a greater variety of foods rather than a few. Bromides may be given in some effervescent form or with ginger ale, but morphine should be prohibited because of its tendency to increase pylorospasm, nausea and, in some cases, late hyperacidity.

As we have run across certain laboratory findings in our cases, classified originally as anorexia nervosa, which promise to throw a certain light on the etiology of this condition, a few case histories will be reviewed.

Case No. 21750. Mrs. M., Japanese woman 31 years of age. Seen October 13, 1927. Family history uneventful. Usual illnesses of childhood. Has had four children, healthy, two miscarriages in 1925 and 1926. Menses normal. No operations. Bowels move regularly without laxatives. Appetite usually good. No nocturia. Heart and lungs normal. No sweats or cough.

Since six months has experienced weakness and numbness in both legs. She had bilateral temporal headaches once a week, which disappeared on sleeping and returned at 4 p.m. Vomitus at first only with headaches, of late rather frequent. In the last two weeks the prostration had gradually caused her to remain in bed, where she lay apathetic and sleepy, refusing foods. Since four months the thyroid had been rather sensitive, as were also the back of the neck and both shoulders.

Status: Lethargic, apathetic, well nourished Japanese woman, apparently taking more interest in her surroundings than she desires to let on. There is a distinct tremor of the half closed lids. Pupils react sluggishly to light and A., nose negative, mouth fetid odor, pharyngeal reflex exaggerated, teeth in poor repair, tongue coated, thyroid tender, chest organs normal. B.p. 100/78, p. 96, reg. resp., 16 occ., sighing.

Abdomen: Excepting a slight degree of tenderness about umbilicus, negative, g.u. normal. Vagina: Uterus retroflexed, otherwise fairly normal conditions. Menses. Reflexes: Knee jerks, right 0, left plus. Ankle clonus, right 0, left 0. Neuromuscular: No atrophies, no spasticities; rather weak and flaccid, apparent reduction of muscular power in arms and legs. Laboratory: Urine: menses, no excess of albumin, sugar trace, sp. gr., 1020. B.m.r. –4, blood sugar 64 mg., Wassermann negative. Spinal fluid; pressure 8 mm., cells 5, glob. negative. Blood: Wassermann negative, hgb. 65 per cent, ery. 3,520,000, lc. 8,000, lym. 28, polys. neut. 72. Radiogram of head shows sella turcica small, sinuses normal, rt. 1. Third molar impacted.

Blood sugar tolerance test:

	Urine	Blood before 79 mg.
1. ½ hr.	200 c.c. trace	1. 166 mg.
2. 1 hr.	300 c.c. .3 per cent	2. 214 mg.
3. 2 hr.	84 c.c. 1.1 per cent	3. 166 mg.

During this tolerance test, twenty minutes after ingestion of the glucose, the patient developed typical tetany with Trousseau and Chvostek, complained of severe bitemporal headache. A few hours later she was quite tender over the thyroid on palpation, which elicited immediate coughing. At all times did she appear to be more drowsy and complaining when her husband was about.

Diagnosis: Pluriglandular syndrome (thyroiditis, hypophyseal disorder, parathyroid deficiency), hysteria (anorexia nervosa).

The patient was put on thyroid extract and glucose, administered by clysma and in the form of lemonades with 5 oz. of glucose a day outside of meals. (No sugar in urine.) Later body massage and surging current were ordered and the glucose gradually cut out. Under this treatment she rapidly improved, became cheerful and communicative as her blood sugar level approached normal. She was discharged on November 7. Blood sugar 150 mg. On November 3 it was 100 mg.

Comment: This case was rather mild and seems to have developed in a woman who had for months previously been suffering from general weakness and pain in the region of the thyroid gland, finally resulting in refusal of foods and a lethargic condition, the hysterical nature of which only became apparent on observing the patient's behavior in the presence of her hunsband. We were struck by the low fasting blood sugar, 64 mg., and the apparent deficiency of the parathyroids. Administration of large quantities of glucose immediately brought about a radical change for the better. Our inference was that we were dealing *not* with a hysterical condition, as it appeared at first, but with a mental condition, which was obviously based upon a disturbed endocrine physiology, with hypoglycemia as a most prominent symptom.

The next case, No. 21681, Miss S., demonstrates the hysterical feature of anorexia nervosa to a much greater degree.

A 20 year old girl of healthy family has been complaining for fourteen years of headaches. Between the age of six and fourteen they occurred twice a week, and from fourteen to eighteen, every day. The headaches came on between 3 and 4 p.m., lasting until she fell asleep. The mother had had a similar condition up to four or five years ago. Occasionally vomitus with headaches, no dizziness. Three years ago she weighed 145 pounds.

She got hold of a doctor book and became convinced that her headaches were due to too much starch. She, therefore, ate only fruit and vegetables with an occasional milk diet. She lost fifteen pounds in weight during the year, and her headaches became less frequent. She had been on various diet fads up to May, 1927. From May to October she ate very little, mostly fruit juices, and lost thirty pounds. She developed gas in the stomach and bowels, became severely constipated, having to take daily enemas, lost her appetite entirely. She decided her teeth were the cause of this condition and had a large number removed. There were emesis and gastric pains. Otherwise, history negative. Last menstruation in May, 1927. Two years ago claims to have had considerable thyroid enlargement. Used one bottle of Amber's goiter cure, swabbing it over the thyroid b.i.d., whereupon the goiter disappeared.

When first seen in October, the following status was noted: Extremely emaciated and weak girl, very much alert and prone to talk about her own condition. She was constantly correcting her very much concerned and apparently uneducated parents in a manner which clearly showed she considered herself very superior and also showed a very marked degree of gratification in her misery.

The physical examination showed, outside of very poorly kept teeth, a slight enlargement of the thyroid, a very slow pulse of 44, easily compressible, blood pressure 100/60; otherwise, perfectly normal. The urine was normal, the stool contained no blood. B.m.r. −24, Wassermann negative, hgb. 85 per cent, lc. 4,600, large lym. 34, polys. 66, blood sugar 47 mg. per hundred.

The sugar tolerance test was:

Urine	Blood before 68 mg.
1. ½ hr. 150 c.c. 0 sugar	1. ½ hr. 125 mg.
2. 1 hr. 200 c.c. 0 sugar	2. 1 hr. 88 mg.
3. 2 hr. 120 c.c. 0 sugar	3. 2 hr. 75 mg.

The diagnosis was anorexia nervosa, polyglandular syndrome. She was put on small frequent feedings, ice bag to the abdomen. Feedings were gradually increased. However, she complained of severe headaches for the first few days. She was gradually put on a 5,000 calorie diet with three ounces of glucose daily and rapidly improved from then on. She had thyroid extract, ¼ grs. b.i.d. She had a distinct hypothermia during the first few days of her hospitalization but, as her nutrition improved, her temperature approached normal. She became stronger and when last seen, January 6, 1928, had gained some thirty pounds in weight, was feeling well, had no headaches, and apparently had overcome her psychic condition. Her blood sugar was 110. Menses were regular.

Conclusions: In this case there seems to be a distinct connection between the anorexia, the deficiency of thyroid, ovary and adrenal function and the low blood sugar.

A third case which I consider coming under the heading of anorexia nervosa is the following:

Case No. 22216. Male, 21 years of age, Swedish. Entered the hospital November 22, 1927. He complained of weakness, nervousness, loss of weight and strength, nocturia, swelling of face and eyes, clouding of mentality and spells of dizziness.

Six months ago he noticed that he was becoming more nervous and losing strength and weight, losing about thirty-five pounds. He became so weak and nervous that he was forced to quit work three months ago. He was worried about this and his condition a great deal. His appetite has not been good for some time and gas causes him much distress a half hour to one hour after meals. He says that at times he "cannot think." He apparently does not lose consciousness, but his mentality is slow. For the past three weeks his face and eyelids have been swollen considerably in the morning. He has to get up to urinate two or three times a night; no pain on urination. No abnormal amount. He states that he has been on various self-imposed diets; on a strict milk diet for three weeks. He gives no history of starvation, however, but says he ate "too much" and was eating all the time, although his appetite was poor. He was usually constipated.

His favorite literature is the Physical Culture Magazine, from which source he has obtained very definite ideas as to his food. He has no faith in physicians and is living on the benevolence of his friends.

Physical examination: Temperature 96°, pulse 60 and regular, blood pressure 90/60. Respiration rate

20, nutrition very poor. He cerebrates slowly but answers all questions intelligently. His face does not show the emaciation characteristic of the body but appears pulpy and swollen. The eyelids are swollen. The eyelids are swollen considerably but no generalized edema is present. Eyes: Palpebral fissure small, due to swelling. Mouth: Teeth show much dental work. Tonsils small. Pharynx not injected. Thyroid small. The heart rate was slow and regular, borders normal, no murmurs. His extremities were very emaciated. Patellar reflexes present and normal. No pathologic reflexes. Coarse tremor of extended fingers.

Laboratory findings: Urine, 30 acidity sp. gr. 1016, otherwise normal. Wassermann, negative. Hgb., 78 per cent; reds, 3,570,000; lc., 6,600; monos., 35 per cent; blood sugar, 64 mg. B.m.r. –45; weight, 109 lbs.

Diagnosis: Anorexia nervosa, polyglandular syndrome, hunger edema.

Treatment: The patient was put to bed and given thyroid extract and ice bag to the stomach. He was put on a slowly increasing diet of the Lenhartz type, with one-half ounce of glucose in lemonade at frequent intervals. He was still complaining of fullness in the stomach and often refused foods, claiming he was eating too much and must rest his stomach. However, the edema of the face rapidly subsided, his temperature became more normal and he made the appearance of being very much improved. His weight picked up to 116 pounds (with loss of edema). Unfortunately this gain was not welcome to him and from that moment on he refused foods and medication so that it became necessary to give him 1000 c.c. glucose and insulin solution intravenously. The blood sugar test the next morning showed 60 mg. per 100. He was put on a general diet and gained only one-half pound that week.

On investigation, it was found that he had gone through the motions of taking his tablets, had kept them in his hand and had thrown them away. He had also disposed of much of his food in like manner. Ten minims of adrenalin was added morning and night by mouth and the patient forced to eat under supervision, gaining up to 119 pounds. His facial expression was very much improved, being practically normal, and his bowels were regular.

Unfortunately he was so obstreperous that he had to be discharged from the hospital. Final blood sugar test was refused. When seen three weeks later he was very much improved, was cheerful, of florid complexion and had gained considerably in weight.

Conclusion: I believe there is no doubt but that we have here a case which would ordinarily be diagnosed as anorexia nervosa in a psychasthenic individual (hysterical) but which obviously bears all the earmarks of deranged internal secretory mechanism, with extremely low b.m.r. and blood sugar. What now is the significance of the low blood sugar in these cases?

The fact that starvation does not seem to have any great effect upon the blood sugar level is demonstrated by the following three cases:

Case 22172. A man with benign pyloric stenosis had been starving for some months, showing an enormous loss in weight and in whom the radiogram showed practically a 100 per cent retention in twenty-four hours. He had been in this condition for four months, weighing now 101 pounds. Three months before he weighed 130 pounds. This man's blood sugar was 90 mg. per 100. B.m.r –14.

Case 22968. A patient who had for years been suffering from stomach trouble and had lost fifteen pounds in the last two months. The radiogram showed an absolute obstruction of the stomach in its central portion and in twenty-four hours well nigh the whole barium meal was still in the stomach. Operation revealed an obstructing cancer and adhesions. In this case the b.m.r. was –6 and the blood sugar 80 mg. per 100.

To these cases may be added the following:

No. 22527. Mr. L., 60 years of age, blacksmith. Operated on two years ago for ruptured gastric ulcer, not well since. The man is greatly emaciated and has grey, dry skin. Radiogram shows a very extreme deformation of the stomach with an almost complete obstruction of the pylorus, with a deep perforating ulcer at the lower third of the lesser curvature and dense bands apparently binding the pyloric end up to this ulcer. There was a 70 per cent rest in twenty-four hours. Blood sugar was 105 mg. per 100 and the b.m.r. –21.

These three cases no doubt were experiencing a much higher degree of actual starvation than the anorexia cases and yet, whereas the b.m.r. is low, in all three their blood sugar values are so much higher that one is forced to the conclusion that the extremely low sugar level in the anorexia nervosa cases is not due to the lack of food but to some other causative factor, probably the adrenals.

A case, not of anorexia nervosa, but of severe pluriglandular disorder and capable, I believe, of throwing some light on the subject is the following:

Case No. 21432, female, 54 years of age, widow. Hereditary history negative. Since two weeks she complains of vomiting, marked nausea, dizziness, being stuporous, marked weakness, tired feeling, loss of appetite, a dull ache between the scapulae, and constipation. She entered the hospital on September 15, 1927.

Three years ago she had a similar attack but worse, the duration of which was eight weeks. A year later she had another attack, the duration of which was eight weeks. This one began on September 1, 1927. Her normal weight is 135 pounds and present weight 125 pounds. She has never been very strong, rather slow, and lacks interest in things, is usually constipated. Menopause at 36 years of age. Her children are well and she has had no miscarriages. She states that her extremities are always cold and she is troubled with some tingling and numbness in hands and feet occasionally. Her daughter states that mother does not walk with precision and accuracy.

The physical examination showed a well preserved woman. Nutrition good, pulse 60, regular, blood pressure 82/59, respiration 19, regular. Patient found lying in bed in a somewhat stuporous condition. She responds when spoken to and observes things about her. She complains of nothing but her stomach hurting her and being weak. Head and neck: Head normal. Mouth: Marked halitosis distinctly uriniferous in character. Tongue not coated. Mucous membranes pale. Teeth wonderfully preserved. Tonsils hypotrophic. Larynx injected. Neck: Thyroid palpable, not modular. Chest organs normal. Abdomen: Tenderness over gallbladder. Abdomen has a somewhat doughy feeling. Skin: On inspection the skin appears lemon tinged. Skin feels cold and dry, not scaly. Marked weakness. Muscles flabby. No tremor of extremities. No edema. Reflexes: K.k. not obtained. No ankle or patella clonus. No babinski. Ophthalmoscopic examination: Disc is quite pale, vessels appear anemic, no edema. Vaginal and rectal examination negative. Urine examination: normal excepting casts moderate, granular and hyaline, many pus cells, blood rare. Urea N., 25.2 mg. Creat. 1.2 mg., icterus 8. The stool was normal. Blood examination: hemoglobin 60, erythrocytes per c. mm. 2,750,000, leukocytes per c. mm. 5,100, lymphocytes 28 per cent, polynuclear, neutrophiles 72 per cent. Wassermann negative. Spinal fluid cells 5, Nonne neg. Catheterized specimen of urine loaded with rods, occasional diplococci. B.m.r. –16. Icterus index normal. Blood sugar 50 mgm.

Sugar tolerance test:

1. ½ hr. 125 mgm.
2. 1 hr. 125 mgm.
3. 2 hr. 78 mgm.

One hour after sugar was given there was no sugar present in the urine.

Diagnosis: Addison's disease or hypothyroidism.

Treatment: Adrenalin three times per day with intravenous glucose. At first, before the nature of the case was understood, 25 units of insulin were added to the glucose. The patient developed a spastic condition of the hands and upper extremities, complaining of cramps with involuntary movements of the arms. These conditions are quite typical of tetany. As a whole her improvement was not satisfactory until, on September 22, she was put on thyroid medication, one grain three times a day with adrenalin and forcing of glucose. She improved very rapidly after this, taking food readily and gaining in weight. When last heard of was feeling fine.

Conclusion: Here we have a case with as many typical symptoms of hypoadrenia as of hypothyroidism but not reacting to adrenalin; however, later showing rapid improvement on thyroid and adrenalin administration with forcing of glucose. Such cases are reported in regard to the treatment of hypothyroid conditions with thyroid extract plus adrenalin, and also in regard to the treatment of hypoadrenia with adrenalin plus thyroid extract. Grote reports a severe case of Addison, in which adrenalin was ineffective until the blood sugar had been brought up to normal by glucose feeding.

Whereas hypoglycemia seems to be a very frequent occurrence in adrenal hypofunction, the writer has not found any mention made as to the frequency of a low b.m.r., but it would seem that it must be a rather logical condition. We must assume that the b.m.r. is most probably dependent upon the sum total of the activities, in part compensatory, of the various ductless glands and that in pluriglandular disorders it does not reflect participation of any one individual gland (Brooks and Kay). Many cases of apparent Graves' disease with tachycardia, tremor, but no struma, are hyperchromaffinopathies, sympatheticotonic states. I do not know whether hypoglycemia is a frequent occurrence in simple hypothyroid conditions, as I have not run across any statements to this effect. It seems that low blood sugar is not uncommon.

Hoxie and Lisherman (Hypoglycemia, *American Journal of the Medical Sciences,* Vol. 173, 1927, page 220) state that of 307 routine blood sugar examinations, 95 showed a fasting blood sugar of 70 mg. per 100. Of these 50 did not rise above 120 during the tolerance test, and of these 23 showed sugar in the urine during the test. The majority of these hypoglycemia cases showed mental inferiority and other inferiority complexes, postinfluenzal asthenia being repeatedly met with. Several of these cases are very similar to those discussed in the present paper. The authors conclude that worries, overwork and exhaustion are the causes of this general nervous state and that the hypoglycemia is the result of the nervous state rather than the cause. However, I am inclined to consider the nervous state and the hypoglycemia as evidence of adrenal hypofunction.

In a very interesting and exhaustive study of twenty-two thousand, eight hundred and eight blood sugar estimations in nondiabetic individuals, John (*Annals of Internal Medicine,* Vol. II, No. 7, page 470) finds hypoglycemia present in 15.14 per cent, assuming 80 to 180 mg. per 100 c.c. to be the scope of normal.

I wish to refer with a few words to a group of cases also showing hypoglycemia, which will be published in a later paper by my associate, Dr. C. L. Morrow. These are a group of cardiopaths with congestive right-sided cardiac failures, described by Josue as asystolic surenale. They all showed white suprarenal line, extreme hypothermia, temperature 96°–97°, hypotension, blue hands, muddy skin and very marked hypoglycemia, down to 60 and less. All improved to a certain degree on adrenalin by mouth (but not digitalis), also forced glucose administration. Some showed mental disturbances not unlike those seen in Addison's disease, and in one of these cases showing marked bronzing. There can be no doubt but that there is a real serious disturbance of the adrenal medulla, developing as the result of the long standing passive congestion (sclerosis).

Autopsy showed one adrenal missing and the other very much atrophied and sclerotic. Here is another group of cases in which we find a very marked lowering of the blood sugar values and definite signs of adrenal damage and hypofunction. The b.m.r. reading was impracticable on account of the dyspnea of the patients, but in one case it was –20 with blood sugar 70.

The hypoglycemia, relative hypotension, hypothermia, asthenia and bronzing occurring in this group of cases, showing congestive cardiac decompensation, seem to me to indicate, if you please, the equivalent of an experimental inhibition of the adrenal function. The writer is inclined, in view of the similarity of the symptoms to those of the anorexia cases, to hold the adrenals primarily responsible for the whole picture of anorexia nervosa, the psychic as well as the somatic group.

Any condition reducing the activity of the adrenals, as inadequate develoment, natal injuries, exhaustion by fatigue, senile degeneration, or any other factors which are capable of reducing secretory activity without provoking an organically demonstrable lesion in the adrenals or their nerve paths, will produce a functional hypoadrenia (Sajous), the main symptoms of which are asthenia, sensitiveness to cold, cold extremities, hypotension, weak cardiac action and pulse, anorexia, anemia, slow metabolism, constipation, psychasthenia, hypothermia and hypoglycemia. There seems to be very little doubt in the writer's mind that the various cases cited above and presenting low blood sugar values belong to the group of functional hypoadrenia and are logically best treated by the treatment outlined above. It also suggests itself that blood sugar examinations should be made in all mental cases presenting symptoms of mental depression, as a low blood sugar would suggest hypoadrenia and require the adequate treatment.

Conclusions: In anorexia nervosa we are dealing with a distinct pluriglandular disorder, with the adrenal and chromaffine hypofunction taking the lead. The psychic and mental inferiority, the hypoglycemia and hypofunction of the thyroid are results of adrenal insufficiency. It is suggested that in cases showing a low blood sugar and low b.m.r. the rational treatment will be directed toward an uplifting of the blood sugar level by forced glucose feeding, and a reestablishing of endocrine balance by administration of adrenalin 10 to 15 drops, t.i.d., with thyroid extract in doses indicated by the degree of the lowering of the b.m.r. It is suggested that many psychopathics may be, in reality, cases of hypoglycemia in hypoadrenia and should be treated as such. It is furthermore suggested that in certain cases of congestive right-sided heart failure with low blood sugar levels a like treatment is indicated.

SWIMMING POOL PATHOLOGY *

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Propaganda by life-saving organizations, physical educators and child-training groups has within ten years vastly increased facilities for teaching and practicing swimming and diving. Fashion and the crowd impulse have incited many physically unfit persons to attempt swimming. Physicians should be aware of the occasional influence of these practices upon the skin and mucous membranes of susceptible persons.

Rules and regulations current in Oregon are published by the State Board of Health in such form as to have attracted favorable notice by the Committee on Otorhinologic Hygiene of Swimming of the A. M. A. in 1925 (*J. A. M. A.*, 87:1998, 1926). Enforcement in Portland remains with the City Health Bureau, which makes regular water tests; State Board tests are only occasional. Necessarily the managers, club employes, caretakers and proprietors of pools will avoid annoying patrons by undue insistence upon hygienic precautions, especially at times of considerable bathing load. The public is intent on pleasure or exercise, and gives little or no thought to hygienic measures.

The effect of water upon the normal individual for moderate periods should be stimulating and agreeable at ordinary temperatures. There should be no danger to the trained swimmer or diver from addition of such amounts of chlorine or copper sulphate as are commonly used. Occasionally, if proper mixing has not occurred or if excess of free chlorine be present, there will be transitory irriirritation of the eyes or nose. Similar irritation, however, takes place after long immersion in plain water.

Swimming is not necessarily beneficial to all; the individual's physical condition at a given time must always be considered. One of the more strenuous physical exercises, it should be indulged in only when the individual is physically fit, and within the time limitation of his fitness.

The skin should be thoroughly cleansed before entering the pool. This can only be done by a soap and water shower in the nude; not running through the shower with the bathing suit on, and jumping in the pool. A sterilized bathing suit, furnished by the management, is then put on over the clean body. Nude bathing is preferable where possible. Skin infections can not then be concealed by suits.

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* Abstracted from a paper read before Portland City and County Medical Society, March 7, 1928, and from a report made to the Public Health Section, Portland City Club.

Spread of disease commonly called contagious is more probably due to contact with other individuals (similar to contact at any other gathering), rather than to contamination of pool water. This is certainly true of epidemics of "sore throats" and "colds," respiratory infection attributed to swimming pools. Digestive, kidney and bladder disturbances are problems of individual resistance and personal hygiene. Chilling of the body in a susceptible person often predisposes to renal disorders.

Those who should not use swimming pools are individuals: (1) whose physical condition is below par, (2) who are fatigued, (3) who are convalescing from any illness (especially the "common cold"), (4) who have any skin infection or abrasion, (5) who have upper respiratory disturbances (throat, sinuses, ear) with or without a history of former trouble in swimming.

Standing around in wet bathing suits lowers resistance by heat loss from evaporation. Well nourished, chunky people are more resistent than slender ones, and women more so than men. Persons of inferior physique should not be forced to take swimming lessons until careful physical examination has been made. Women starving to reduce weight should not swim.

Salt water causes fewer respiratory troubles than fresh, probably because its taste warns the bather to keep it out of his mouth and nose. Certain persons have a definite idiosyncrasy toward water irritation; they are prone to chapping, eczema and dermophytosis of the face, hands or feet.. Susceptibility to hay fever does not forbid swimming.

The old "breast stroke" is far less dangerous to the nose, throat and ear than the various styles of immersion swimming now in vogue. Breathing should be out through the nose whenever the face is under the surface. Diving is especially dangerous, if exhalation is not done through the nose.

If water enters the nose and its sinuses, or the ear canal or eustachian tube from the throat, and remains any length of time, swelling occurs and irritation begins, predisposing to infection by germs already present. It is not necessary to assume that the water brought in germs from elsewhere, although this is possible, if the pool water is full of sediment or covered by floating oily scum. In children the adenoid mass may swell and mechanically obstruct the eustachian tube, and interfere with nasal breathing and nasal drainage. Water retained in the normally empty sinus cavities may cause edema of the ciliated epithelium and its loss in patches; this facilitates invasion by pathogenic organisms, with severe irritative symptoms and eventual suppuration.

Persons suffering from eczema of the auditory meatus, from middle ear suppuration, or from any form of chronic nasal discharge, should *in their own interest,* refrain from swimming with the head submerged or from diving. Danger to the nose, throat and ear is far oftener from the individual's driven deep into relatively unprotected regions by the irritative action of water under pressure, or blown in during efforts at removal. Ear stoppers are useless in preventing infection.

We have recently asked for opinions from all of the otolaryngologists in Portland, and also from a selected list of eminent clinicians throughout the United States, regarding the incidence of upper respiratory disease from swimming. In the experience of the twenty men who see most of this work in Portland, nearly four hundred cases directly traceable to swimming and diving occurred in 1927.

Of these, 63 per cent were in children, 37 per cent in adults. These were divided as follows: 66 cases of furunculosis of the external meatus; 141 cases of catarrhal otitis media; 75 cases of purulent otitis; 14 of mastoiditis, presumably requiring operation; and numerous cases of eczema of the external meatus. In the nose and throat occurred: 102 cases of acute rhinitis, 52 of acute ethmoiditis, 18 of frontal sinusitis, 105 of maxillary sinusitis, and 18 of acute tonsillitis. Among these people 60 also had transient conjunctival irritation, of which perhaps half the cases needed more or less treatment.

Most of these cases came from the heavily loaded club and school tanks; comparatively few from large commercial tanks, parks, river or sea beaches. All these Portland men agree that persons with obstructive allergic rhinitis, previous mechanical nasal obstructions, sinusitis or otitis are more likely to have exacerbations after swimming. Individual resistance, good habits in diving and swimming, and freedom from personal infections in the nose, throat and ear are said to explain the fact that so few out of the many using the same bathing facilities are not simultaneously infected. "Crawl" types of swimming and diving are unanimously considered more dangerous than the old breast stroke. Ear stoppers are thought useless in preventing otitis, except perhaps to keep water out of an existing perforation.

Experienced swimmers are considered less likely to have trouble than beginners.

Opinions stated by good men in Seattle, Spokane, San Francisco and Los Angeles, and by Drs. J. C. Beck, Chicago; R. C. Lynch, New Orleans; Thos. E. Carmody, Denver; Arthur W. Proetz, St. Louis; Ross H. Skillern, Philadelphia; Lee M. Hurd, New York; and Harris P. Mosher, Boston, are very similar to the Portland findings. Their average number of cases runs from three to fifty directly attributable to swimming, an average of about twenty. They see about 75 per cent children to 25 per cent adults. It will be noted that without much difference of climate there is conclusive evidence of the existence of disease caused by careless or unwise indulgence in swimming and diving in every part of the United States. Attention to proper breathing habits and avoidance of hard blowing of the nose are as necessary in the summer as in winter; avoidance of body chilling is as desirable in Florida as in Washington or Missouri.

Bad sanitary conditions due to lack of circulation and filtration apparatus seem particularly likely to occur in the grossly overloaded outdoor pools in summer time.

The collaboration of Drs. William Levin, L. Howard Smith, G. E. Burget, and of Mr. R. E. Koon, C.E., has been very valuable in consideration of the problems of Portland swimming places; and their report to the Portland City Club, which includes engineering data, will be of great value to progressive physicians and health officers. Their recommendations include:

1. Publicity by poster and slogan, and funds for enforcement, for regular inspection, licensure and sanitary management by the City Health Bureau and the State Board of Health; and enactment of such legislation as may be necessary to secure such enforcement.

2. Advice to the public forbidding swimming when physically unfit, especially when suffering from acute or chronic "colds," ear disorders or skin troubles.

3. Advice to the public regarding proper breathing habits while swimming.

4. Provision by public agencies of funds adequate to insure proper sanitary measures for all outdoor pools during this and succeeding summer seasons.

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THE BACTERIAL FACTOR IN GOITER

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All goiter pathologies are an integral part of a common cycle, peculiar to the subject of goiter. A goiter may have a general diffuse, very similar pathology throughout the gland, which is generally true of the recently acquired, or as variable as possible in the old goiter, upon which the Basedow syndrome has been superimposed.

A common factor must be the basis of all types of the disease. Continental observers have expressed themselves very definitely upon this matter years ago. The entire gamut of thyroid disturbances, including the sequelæ and the congenital cretins, must be explained upon this same common factor.

Considering the present bankrupt status of a bacterial cause, which is due to the inability by so many to cultivate bacteria from goiter tissues with any degree of constancy, a reexamination of the question is in order; and this is particularly so, upon the discovery of a singular behavior of the organisms found in goiter tissues. In more than three hundred studies of goiter tissues, practically one hundred per cent positive cultures have been obtained. This fact arouses a positive interest, which should have a greater value than any theoretical considerations heretofore advanced.

The role of iodine is but a factor, secondary to that basic infection factor, which causes the degeneration of structure and necessarily its functions, upon which the incapacity of the cells to properly handle iodine is based. The low ratio of iodine in goiter tissues must be considered a low thyreoglobulin content and not a low content of simple inorganic iodides. This low ratio can have no other interpretation than a low thyroid production. The hypothyroid function, especially in the presence of available iodine, which is never absent in the blood, food and water, is a greater factor in arousing a compensatory hyperplasia than a diminished iodine alimentation.

The important role of iodine as found in normal thyroid metabolism is unquestionably modified in goiter. Its almost valueless position in the treatment of goiter does not confirm an iota of its theoretical deficiency role. Other deficiency diseases are prompt in correction by the administration of the deficiency factor.

Iodine arrives in the gland as the sodium, potassium and calcium iodides. The primary disturbances of function in goiter appear as a violation of those processes, whereby the cells pick from the blood stream those elements which are desired for their special function. Just how the cells split the iodine from the base salts is unknown. Thyroxin, the active hormone of thyreoglobulin, has no base elements in its molecular structure. The generally accepted 60 per cent iodine content of thyroxin is based upon poetic license and is contrary to the general rule of atomic ratio calculation. This places the iodine content at approximately 10 per cent. According to Kendall's irregular calculation, water has eight times as much oxygen as hydrogen.

Until iodine is split from the base salts and utilized in the construction of thyreoglobulin, it has not a scintilla of value, in so far as simulating to a degree the metabolic influence of thyroxin. That which is the cause of the drop in the capacity of the cells to handle available iodine is the cause of goiter and this is infection of the gland.

Whether identical findings will show up in other goiter belts as in this densest of endemic belts, an opinion cannot be ventured. Confirmations of undoubted value may settle a ubiquitous factor, common to all belts.

The usual organism found in goiter tissues in the vicinity of Tacoma is a Gram-positive pleomorphic coccus. By an heretofore unused technic it is fairly well established that the organism, while having extreme facultative adaptability to growth on ordinary media, has as an initial peculiarity its obligatory anaerobic disposition. Direct inoculations from the juices of goiter tissue are invariably negative on all culture media. Synchronous controls are negative. After transfering goiter tissue into sterile tubes directly from the operative field, with a most meticulous aseptic attention against the possibility of contamination, the subsequent steps in the technic practically preclude the possibility of admission of contaminating organisms. After processing these tissue tubes through various steps, cultures are obtained with a monotonous regularity.

Large doses by combined subcutaneous and intraperitoneal injections fail to kill guinea pigs. The luxuriance of bacterial growth in subcultures has raised the consideration of staphylococci. There are features pro and con. There has been no baptismal party as yet on this score, reserving a name for a future time and after a more detailed differentiation can be made, the constancy of culture for the present being more important than the hair splitting matter of classification.

There can be found no evidence in literature that there is any except a transitory oversecretion of normal thyroid product and then only is it induced by the acute exigencies of life. Also there is no evidence that the excessive experimental administration of thyroid extract or thyroxin ever induced any of the organic changes, associated with and peculiar to Graves' disease.

Practically all pathologies, including goiter, are due to in situ bacterial activity and circumscribed within the bacterial radius. A few infections associated with violent toxins do have a distant play. In a final analysis bacterial products, rather than the mere presence of the bacterial bodies, produce all pathologies, the nature of which is greatly determined by the tissue reaction to each poison. These products obviously are most concentrated and effective in the immediate vicinity of the bacteria. The fibrosis, the round cell infiltrations and lymphatic involvements must be considered bacterial effects, particularly so by the fact of constant bacterial culture from goiter tissues.

The syndrome of Graves' disease in essential is due to an active infection process, centralized in but not limited to the gland. In view of the recognized degenerations of the gland, it is hard to believe that a normal product is elaborated. Whether or not a bacterial toxin molecule is attached to thyreoglobulin in its elaboration in a bacterial environment is immaterial, for there can be no doubt that at least a poor quality of secretion is synchronously mixed with toxins of bacterial origin. Upon this poisonous mixture the gland activity is erroneously interpreted as hyperthyroidism. Dysthyroidism is a more appropriate term. There is sufficient evidence in hand to ascribe the associated pathologies in Graves' disease to the same infection found in the gland.

Removing in large part an inherent pathologic laboratory, which every toxic goiter is, explains the change for good by thyroidectomy. The residual or persisting signs after operation are explained as due to the same initial cause. The recurrences after a period of apparent cure must have the same common basis. Since iodine has no influence in inhibiting the regeneration of a normal gland, it appears very questionable that Lugol's solution could modify the peccancy of the stump of a thyroidectomized gland. The regeneration of the gland to normal limits, minus the persisting infection in the stump, would not be followed by excessive growth and recurrence of the same type of goiter.

Limited confirmations in hand, from widely separated districts of the United States, leave little doubt of a bacterial factor, the ubiquity of which may be later established. A complete confirmation of this conception of goiter will find the present inexplicable sophistries upon the subject dumped into the limbo of outworn theory and subjecting the present empirical treatment to radical modification. The role of iodine in goiter will be relegated to its proper secondary and incidental position.

The postoperative treatment with antigen of autogenous construction, followed by the early cleaning up of the usually protracted residual signs in the toxic types of goiter, leaves little question upon the infection cause of the disease. The prevention of recurrences is anticipated by steps directed against this specific cause, rather than limiting attention to its effects, the goiter.

Detailed technic will appear in a future issue of this journal, with a general conception of the entire goiter question, particularly as it applies to the Pacific Coast.

THE HOME CARE OF DIABETIC PATIENTS *

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INTRODUCTION

A discussion of any of the problems incident to the care of diabetic patients holds a wealth of interest for all doctors. Most of the voluminous literature regarding diabetes has taken the purely scientific point of view, laying down the precise methods of diagnosis and treatment as is available in our large specialized hospitals, with scant regard for that numerically greater problem of caring for diabetics in the home.

These discussions usually presuppose such valuable procedures as glucose tolerance tests, blood sugars, estimation of carbon dioxide combining power of the blood, quantitative urinalysis, weighed dietaries, ketogenic ratios, etc. Without the semblance of a desire to disparage the merits of such a scientific viewpoint, which we faithfully utilize whenever possible, it is our intention today to compromise the purely scientific with that impelling and ever present practical problem, the home care of diabetics. No amount of effort *has ever* brought or *will ever* bring all or even a majority of such patients into this accurate hospital care. Obviously, then, there is need for emphasis of practical standardized methods within easy reach of every general practitioner. If Mohammet will not go to the mountain, the mountain must be brought to Mohammet.

The home management of diabetics to be successful must of necessity take into account at least the five following considerations: (1) diagnosis, (2) selection of cases, (3) home treatment of uncomplicated cases, (4) instructions and cautions, and (5) the emergency treatment of coma.

DIAGNOSIS

The diagnosis of diabetes mellitus is usually a very simple matter. The discovery of glycosuria, associated with the cardinal and classic diabetic symptoms, will always establish the clinical diagnosis. But, as in most clinical entities, a border line type of cases exists, where the diagnosis is far from obvious. It must be constantly borne in mind that glycosuria does not always mean diabetes any more than a sugar-free urine establishes its absence. A safe rule to follow in case of these indeterminate glycosurias, is to treat them *all as true diabetics*

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

until the reverse is proven. Thus, mild and incipient diabetes will not be neglected for the want of the cardinal symptoms of polyuria, polydipsia, polyphagia and loss of weight. Thus, also, many such patients will be spared the disagreeable restrictions, incapacitating complications and protean dangers so characteristic of this malady, if neglected until a full blown syndrome appears.

While such a procedure is a safe rule-of-thumb in the diagnosis of symptomless diabetes (true diabetes with no signs save urinary sugar), it occasionally leads to unwise treatment of *pure renal glycosuria.* Recently such a patient came under my care who had thrice been aborted by a leading obstetrician because an erroneous diagnosis of diabetes had been made. Since a diagnosis of renal glycosuria has been made, she has become a normal mother to a normal child.

This rather rare condition can always be ruled out or established by blood sugar determinations and a glucose tolerance test. These, however, are not usually available in the home. In their absence such a condition may be differentiated from the symptomless glycosuria of true diabetes by careful dietary restrictions. If the concentrated sweets, e.g., sugar, bread and other starchy foods are excluded from the diet and the protein is reduced, all true but mild diabetics will desugarzie. In case of renal glycosuria such food restrictions rarely ever render the urine sugar-free. The court of final appeal, however, is a glucose tolerance test, which of course is a clinical laboratory procedure, but it should be utilized at any cost, if doubt exists after applying this rough test of qualitative food restrictions.

SELECTION OF CASES

Second only to the importance of diagnosis is a clear recognition of the type of diabetic patients that may be safely and successfully cared for in the home. The last vestige of justification for home management is removed by the failure to recognize that about one case in four is a hospital case on every count. Any attempt at practical home care for such a patient can only end in dissatisfaction to the patient and discredit to the attending physician.

It must be remembered that true diabetes may be mild as a birthmark or as virulent and rapid as a pneumonia. Patients have actually been known to die within one week after the onset of diabetic symptoms. This marked variability in type constitutes the basic reason for selection.

Juvenile diabetes is strikingly difficult to keep under control and, even with insulin, makes the tenure of good health, even life itself, somewhat uncertain. Diabetes occurring before the age of thirty-five or having a sudden onset or beginning as a sequel of an acute infection, whether in childhood, mature years or the senium, is almost certainly a hospital case.

Another group which should be recognized as unsuitable for home care is diabetes with complications, especially surgical. Among the most common grave complications are (1) acute infections, in which the sugar tolerance constantly fluctuates but usually hovers near the zero point, (2) gangrene, in which likewise the sugar tolerance varies and which renders surgical intervention imminent, (3) other nonspecific surgical conditions, e.g., gallbladder disease, appendicitis, toxic goiter, etc., where surgery is extremely hazardous save under precise diabetic management. Comatose patients are likewise much safer when hospitalization is practical, but this is frequently impossible, necessitating emergency home care. With the exclusion of these severe and complicated types, which embrace about one-fourth of the total number of diabetics, the remaining three-fourths may be safely and successfully treated at home.

HOME TREATMENT

First: Provide a simple but specific serum which meets the requirements of a satisfactory scientific dietary. Such a menu approximates, though it can never be said to equal, a weighed diet. It is infinitely better than the so-called qualitative restricted diet, i.e., a diet merely excluding the concentrated sweets and the high percentage starches, and leaving the patient to choose the rest. While the latter is often useful in mild cases, it will frequently fail to desugarize patients who can easily be desugarized on some such specific diet as the following. This should be written or printed so that no error is excusable. It should include only food articles which can be procured from any larder.

Breakfast	Grams
One orange or one-half grape fruit	100
Butter, 3 pats	30
Bacon, 3 strips	30
Eggs, one	
Bread (any kind), one-half slice	15
Cream, one-half glass	100
Coffee	
Lunch	
Ten per cent vegetables, scant one-half service	50
Ten per cent vegetables, scant one-half service	50
Butter, 5 pats	50
Meat, one small service	60
Bread, one-half slice	15

Dinner

Five per cent vegetables, large service	250
Five per cent vegetables, scant one-half service	50
Ten per cent fruit, scant one-half service	50
Butter, 3 pats	30
Bacon, 3 strips	30
Eggs, one	
Cream, one-half glass	100
Bread, one-half slice	15

This diet contains about 75 grams carbohydrates, 50 grams protein, 195 grams fat, and about 2250 calories.

For the patient's convenience in making a choice of fruits and vegetables of low carborydrate content, the following list should be furnished.

Five per cent vegetables: Cucumbers, lettuce, spinach, asparagus, rhubarb, endive, marrow, sorrel, sauerkraut, beet greens, dandelion greens, swiss chard, celery, tomato, brussels sprouts, water cress, sea kale, cauliflower, egg plant, cabbage, radishes, string beans, broccoli, mushrooms.

Ten per cent vegetables: Pumpkin, turnip, kohlrabi, squash, beets, carrots, onions, leeks, rutabagas.

Ten per cent fruits: Grapefruit, lemons, oranges, cranberries, strawberries, blackberries, gooseberries, peaches, pineapple, watermelon, cantaloupe.

Second: Teach the patient a simple method of making a urinalysis. The following printed slip I have found exceedingly valuable:

Urine test for sugar.

1. *Equipment*
   - a. Benedict's solution, qualitative, 1 pint.
   - b. Test tubes, medium size, 2 tubes.
   - c. Medicine dropper.
2. *Method of Making Test*
   - a. Pour one teaspoonful of Benedict's solution in a test tube.
   - b. Drop 6 drops of urine into the solution in the test tube.
   - c. Shake the tube.
   - d. Set the tube in boiling water for five minutes.
3. *Interpretation of the Test*
   - a. If solution in tube remains blue—no sugar.
   - b. If it turns green—trace of sugar.
   - c. If it turns yellow—moderate amount of sugar.
   - d. If it turns red—large amount of sugar.

With these specific written instructions as to diet and urinalysis any average patient can carry out a week of this dietetic treatment and keep a record of the urine tests made twice a day, night and morning. If the urine comes to remain sugar-free (as usually happens), the diet may be increased by adding certain specific amounts of food to the original diet (give examples). When sugar reappears, the diet should be reduced well below the patient's tolerance, though not below the original test diet. In case this test does not desugarize the urine, insulin is indicated. Here again hospitalization is highly desirable, though not absolutely imperative. If, however, it is possible, as is often the case, insulin may be effectively and safely given at home, provided the patient remains on the fixed test diet and examines and records each voided specimen, while the dosage is being established.

Third: Teach the patient or some member of the family to give the insulin hypodermically thirty minutes before meals, following the scheme of increase until the urine is sugar-free.

	Breakfast	Lunch	Dinner
First day	5 units	0	0
Second day	5 units	0	5 units
Third day	10 units	0	5 units
Fourth day	10 units	0	10 units
Fifth day	15 units	0	10 units
Sixth day	15 units	0	15 units
Seventh day	20 units	0	15 units

If a reaction occurs, it will be just before lunch or at bedtime. It can be recognized by nervousness and perspiration. It can be corrected by taking ordinary food such as orange juice or milk. It is not dangerous, if increase of insulin is stopped when urine is sugar-free.

If at the end of this second week the urine still shows sugar, it is well to abandon the daily increase and hold the patient on twenty units before breakfast and fifteen before dinner. An increase in sugar tolerance frequently occurs, thus making a previously inadequate dosage adequate. If sugar still remains, the dosage must be increased or given at more frequent intervals. Such a patient is a relatively severe diabetic and must be controlled by very *careful* increases of dosage along the lines laid down above.

Somewhere between sugar-free urine and insulin reactions the right dosage is discovered for each individual patient. When the urine is sugar-free most if not all the day, it is well to hold the dosage constant. When a reaction is induced by either too large a dose or an increase in sugar tolerance on the part of the patient, the dosage just preceding such a reaction should be reduced by five units daily until a balance is struck between reactions and glycosuria. The patient or some member of the family should be instructed regarding the probable time and nature of symptoms of a hypoglycemic reaction and its simplest antidote.

INSTRUCTIONS AND CAUTIONS

Joslin has emphasized the fact that "the diabetic patient lives longest who knows most." It is feasible for a doctor in making house calls to emphasize the importance of accuracy and faithfulness to diet, the necessity of daily urinalysis, the danger of coma, gangrene and infections. The average patient is greatly benefited by reading some simple but scientific book on the nature of diabetes, its treatment and its complications. Notable among these are Joslin's Manual and Wilder's Diabetic Primer. The former seems to me to be more comprehensive, the latter more practical. Such additional literature makes for more cooperation on the part of the patient, less danger of complications and less likelihood of misinformation so generously furnished by individuals and companies promoting fake diabetic cures.

THE EMERGENCY TREATMENT OF COMA

In closing it may be well to call attention to the emergency care of patients in the acidotic coma of diabetes.

1. General treatment. (1) Bed, (2) keep patient warm, (3) cleansing enema, (4) lavage, (5) stimulants, (6) hot fluids by mouth, rectum or subcutaneously.

2. Specific treatment. For an adult, inject 20 units of insulin subcutaneously every two hours till the urine is sugar-free. This entails the constant attention of a doctor or competent member of the family who is able to test and interpret the Benedict test. If death is imminent, 50 units hourly for three injections is desirable, provided the glycosuria persists. Such heroic efforts are rarely necessary. Many coma cases require 200 to 400 units of insulin in twenty-four hours given as above outlined. Any failure to push the dosage to the point of producing sugar-free urine is often attended by a relapse of the patient into coma. The longer the patient is in coma, the more grave the outlook. Hence the importance of early and heroic effort.

Sugar may be given by mouth, rectum or intravenously to act as a buffer between the insulin and a hypoglycemia, though experience and reason have not established its necessity.

SUMMARY

1. Effective home management is a diabetic problem which has not received attention commensurate with its importance.

2. A correct diagnosis of diabetes can almost always be made in the home.

3. The selection of appropriate cases for home management is of prime importance.

4. The treatment must be specific and definite as to diet, urinalysis and insulin, whenever the latter is necessary.

5. Minimal but important instruction of patient is practical.

6. The emergency of coma may be successfully overcome without hospital management.

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HISTORY TAKING*

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From observation I am convinced that history taking is almost a lost art, both in hospitals and in the offices of the profession. Most histories are poorly taken, if taken at all, and then they are merely a jumbled mass of unrelated facts.

The object of a history is to flash upon the mental screen of the observer a clear, concise picture of the events of a patient's life and the influence of heredity upon it. It should contain the present chief complaints, arranged in the order of their importance with the idea of grouping them in syndromes. A mere mass of unrelated facts, bearing no correlation to each other and having no sequence in their appearance, cannot be called a history.

In taking a history, the physical, mental, psychic and religious make-up of the patient must be evaluated. Some patients make mountains out of mole hills; others suffer so much more with the same conditions present than the majority of humanity that one must place a just value on what he is told. It is necessary to stop a patient from relating a long, rambling, wild-eyed tale of woe which consumes time and means nothing. Bring him down to earth with a thud and start over again on what is important. Religious and psychic patients experience many varied, peculiar, unreal and fantastic sensations, on which a just estimate must be placed. After the general make-up of a patient has been estimated, the present chief complaints should be arranged in syndromes in the order of their importance, in clear-cut, forceful statements. Practice soon teaches what to put in and what to leave out.

Recently I had occasion to witness an accepted diagnosis without even the formalities of a history, the diagnosis being acute appendicitis. Neither the diagnostician nor anyone else thought it necessary to do other than accept the diagnosis as stated. Upon opening the abdomen there was a general surprise to find the real diagnosis to be a ruptured tubal pregnancy with the abdomen full of blood.

If a proper history is taken one should be able to make a correct diagnosis in at least 45 to 50 per cent of all cases.

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

Due credit is hereby given to the Englebach Clinic of St. Louis for the majority of facts in this paper.

The following outline will illustrate what I mean by a good history:

HISTORY OUTLINE

Build up or exclude a clinical syndrome. Prove or disprove a positive symptom-complex. At the conclusion make diagnostic deductions from the history. A mass of disassociated, irrelevant complaints or signs does not serve as a history.

Name Address Telephone Date
Reference of:
Age Occupation Nationality Religion
Relatives Address Telephone
History obtained by:
Information bearing on insurance, etc.
Order:

- I. Present.
  - A. Chief complaints.
  - B. Duration.
  - C. Course.
    - a. Onset.
    - b. Progress.
- II. Past.
- III. Personal.
- IV. Family.

I. *Present*

A. Chief complaints.

Narrate the chief complaints in the order of their importance. Elicit all complaints before arranging them in this order. Use the patient's own words as much as possible. Avoid such diagnostic notations as "attack of appendicitis," "gallbladder," "gallstones," "migraine," etc., using instead description of the chief complaint, such as "pain in the right lower quadrant of the abdomen associated with nausea, vomiting, fever, etc." Avoid unnecessary details.

B. Duration.

Determine absolutely the onset of the present illness before placing it in the history. It will be necessary be repetition to go farther and farther back in the history with the patient in order to determine the exact onset of the present illness. The duration should then be stated in so many years, months or days, such as "six months and two days," and not given from a certain date, such as "since May 15, 1926."

C. Course.

a. Onset:

Attempt, if possible, to associate the onset with any possible etiology, such as trauma, exposure, previous infection, operation, etc.

State in chronologic order the sequence in which signs and symptoms occurred. Attempt to define a symptom-complex by inquiring about the cardinal signs and symptoms in their proper sequence. As soon as one symptom of syndrome is given, interrupt the narrative by determining at once whether or not other cardinal signs of that disease occurred. For instance, if the patient complains of pain in the upper abdomen, then determine, if possible, whether that pain is due to gastric ulcer, duodenal ulcer, gallbladder disease, renal colic, aneurysm of the descending aorta, tabetic crisis, etc., by cross-examining the patient for all of the other cardinal signs and symptoms of these diseases.

The most important deductions to be obtained fro mthe history are those which build up an isolated syndrome or which exclude the possibility of the patient having a definite disease. For instance, a pain over McBurney's point following within six or twelve hours a general abdominal pain associated with nausea, vomiting, chills, and fever would be almost sufficient upon which to make a diagnosis of appendicitis. On the contrary, a pain over McBurney's point that began at this location and afterwards was projected into other regions of the pelvis, not associated with nausea, vomiting, chills, fever, and leukocytosis, would exclude the possibility of appendicitis.

Direct attempts should be made to "hook up" the chief complaints and distressing symptoms with some organ or localized diseased process in the abdomen by surrounding one of the cardinal symptoms of signs of such disease with the other cardinal signs or symptoms of its complex. For instance, fever ssociated with a pain in the epigastrium would exclude the possibility of gastric or duodenal ulcer unless such ulcer was complicated by perforation. On the other hand, a pain in the epigastric region that is so intense as t orequire a number of hypodermics of morphine for relief would be sufficient almost in itself to indicate gallbladder or renal colic, the *intensity* of the pain excluding many other lesions in this portion of the abdomen having pain as one of the cardinal signs, such as ulcer of stomach or duodenum. Severe abdominal cramp followed by mucous or bloody diarrhea would incriminate the colon.

Pain in the chest followed by increasing respirations and rusty sputum would point to pneumonia. Amenorrhea, associated with an unusually rapid gain in weight *without* other symptoms of pregnancy, would be sufficient to diagnose Froelich's syndrome, etc.

b. Progress.

Progress of disease includes the time from the well established onset to the time of obtaining the history. The sequence of medical events should be rapidly obtained and arranged in proper chronologic order. Additional data to the clinical course, such as the effect of special medication, should be described. Observations of other physicians and their diagnosis, treatment, medical or surgical, etc., should be given as directly as possible.

c. Additional signs and symptoms should finish up the description of the clinical picture of the present illness by giving other symptoms and signs referable to other systems which may be of secondary importance or indicate some distant or related condition. In doing this, in order to avoid overlooking important signs and symptoms, it is well to take up the systems in order, such as (1) circulatory, (2) respiratory, (3) gastrointestinal, (4) genitourinary, (5) nervous and (6) special systems. As the present illness will usually fall within one of these systems, it will not be necessary to review those relating to the present illness as related to the system, but only those other systems not touched in dealing with the present illness.

II. *Past.*

a. General health of patient through life, as good, fair, bad, this to determine relation of present complaints to general state of health.

b. Development. Weight at birth, eruption of teeth, onset of walking and talking, mentality and development through early childhood, weight, etc. (Include any significant facts occurring in early life.)

c. Childhood diseases, with possible sequelae or complications.

d. Infectious diseases through life. These may be taken up by decades or questioned about in definite order; e.g., pneumonia, typhoid, rheumatism (acute, articular or inflammatory), scarlet fever and diphtheria.

e. Symptoms by systems:

1. Circulatory system: Dyspnea, tachycardia, palpitation, vertigo, fullness in head, tinnitus aurium, scotomata, edema (may include symptoms of cardiovasculorenal disease).

2. Respiratory system: History of frequent and persistent coughs and colds (tuberculosis, bronchitis), hemoptysis, pleurisy.

3. Gastrointestinal: History of stomach disturbances, indigestion, pain, with its relation to food, nausea, or vomiting, hematemesis or melena, jaundice. A brief gallbladder, appendix, ulcer, or colon history can be brought out at this point.

N.B. The stomach is a barometer of constitutional diseases.

4. Genitourinary: Urinary disturbance of any description, burning, frequency, hesitancy, polyuria, hematuria, with or without associated renal colic history. In women a pelvic history may be obtained at this point.

5. Nervous system: Motor and sensory disturbances, including psychic disturbances where suspected. Motor: disturbance of gait and station, myasthenias, ataxias, etc. Sensory: anesthesias, paresthesias, lightning pains, numbness, "velvet carpet" sensation.

6. Special senses: (1) Perversions of taste or smell. (2) Diplopia. (3) Amblyopia. (4) Hemianopsia. (5) Fortification-spectra and scotomata with "migraine."

f. Operations. Date, nature, and operator.

g. Injuries.

III. *Personal.*

Sleep. Appetite. Bowels: (a) regular with or without laxatives; (b) constipation—laxative or cathartic so many times a week. Urination D — 7 x / N — 6, or simply, nycturia 2 to 3 x. (Habits in regard to these may be questioned about: e.g., how much sleep, when meals taken, kinds of foods, etc.). Tea: Two cups a day. Coffee: Three cups a day. Alcohol: averages two to three drinks of whiskey a week. Tobacco: cigars two to three a day, cigarettes twenty a day; pipes: eight to ten a day; chews: one plug a day.

Venereal history: (1) Neisserian; number of infections, duration, treatment, complications, and recurrence. (2) Specific or luetic; sore on penis, character, duration, appearance of secondaries, rash, sore throat, mucous patches, falling hair. In women, a bladder history, with persistent vaginal discharge, is suspicious.

Marital history: number of pregnancies, with miscarriages. (Same questions to be asked male patient about wife.)

Libido: Increase or decrease.

Menstrual history: Onset of periods, regularity, interval, duration, amount and character of flow. Menopause: Onset, duration, symptoms.

IV. *Family.*

Father, living or dead, age and cause of death. Mother, same. Brothers, number living and dead, ages and causes. Sisters, same.

Constitutional illnesses: (1) Tuberculosis, with history of exposure of patient. (2) Bright's disease. (3) Diabetes. Mental conditions. (5) Endocrine disorders; obesity, type of parents, etc.

Diagnosis from history: Should be made in writing on first page at the conclusion of each history in order to develop the elicitation of histories which will permit of positive deductions.

CONCLUSIONS

1. General neglect in proper history taking, both in hospitals and private practice.

2. History furnishes a mental picture on the screen of the patient's life and the influence of heredity upon it.

3. Practice required to put in and leave out what is necessary.

4. History outline as given, if made a routine, should furnish material for correct diagnosis in at least 40 to 50 per cent of all cases.

BRONCHOLITHIASIS

J. F. Scott, M.D.
YAKIMA, WASH.

Mr. T. S., age 56, sheepherder, no history of pulmonary trouble, had a right herniotomy under general anesthesia eight years ago, infected left hand four years ago; no other hospital experience.

He was operated on December 19, 1927, for left indirect inguinal hernia, under novocain and light nitrous oxide. Anesthesia was uneventful. He was awake before leaving the surgery and did not vomit afterwards. He had the chest protected by camphorated oil and a pneumonia jacket in the routine way.

December 27, at 2 p.m., he had a sharp pain in the left chest and coughed up some bright red blood. Ice was applied and morphine given. This continued with violent coughing and raising blood fairly profusely for twenty-four hours, when he expectorated a broncholith about 1 c.m. long and 4 mm. in diameter. Following this the cough and expectoration ceased permanently. The mass was apparently all calcareous; no organic matter was noted.

Broncholithiasis is a rare condition, but known to the ancients, usually latent and discovered at autopsy. It is frequently associated with tuberculosis, but also found in other diseases and may give rise to the usual symptoms of a foreign body in the bronchi. Stones may develop by calcification of pulmonary tissue or may result from incrustation of exudates in the bronchi by the deposit of granules of lime salts without tendency to ossification. The calcification may be parenchymatous or occur in cavities. These masses are referred to as lung stones, pressure liths or broncholiths, and the clinical manifestations accompanying their expulsion is what is known as stone asthma or bronchial colic. The signs are usually unilateral and resemble those of lung abscess or a foreign body in the bronchus.

In an article reporting a case in 1922 A. R. Elliott[1] states that at that time in no case had the roentgen ray succeeded in demonstrating the presence of free stones in the bronchi. The true condition is recognized only when the stone is expelled. Stones are usually multiple.

Chevalier Jackson[2] reports the removal in 1921 of a stone by the bronchoscope with recovery. He makes a distinction between broncholiths and pneumoliths. True pulmonary stones originate in the lung tissue and are the result of their pathologic transformation.

Most cases that have been reported give a chronic history of invalidism, clearing up after expulsion of the stone.

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EDITORIAL

MODERN MEDICAL ETHICS

The ethics of consultation is a large subject that needs frequent discussion and revision. Evolution in ethics is just as important as it is elsewhere. Changes in methods of practice, the widespread establishment of clinics in which almost every patient is ministered to by several men, the advent of new schools of thought both within and without so-called "regular" practice, all contribute to the need of change from time to time. With better ethics, more thoroughly understood, there is gradual improvement in the relationship between physicians and the status of medical practice is steadily being elevated. More and better county societies have contributed to this improvement. It is only yesterday, as it were, that in small towns all physicians were supposed to be enemies and patients not infrequently believed they could better their standing with their own doctors by bearing evil tales about their competitors. But the present vogue is to minimize causes for controversy and ill feeling. The wise physician is he who speaks well of others in practice and everything that contributes to mutual good will is helpful to everyone who makes his living through the healing art.

In bygone times physicians rarely referred patients to one another without being on hand for bedside consultation and conference. Such conferences give opportunity for discussion of the case from various angles and are often more satisfactory than having examinations made by different men without actual bedside consultations. But they are time-consuming and often inexpedient. They necessitate that all the physicians concerned shall lay their plans to be at a certain place at a certain moment. This is often inconvenient, occasionally all but impossible. To be at the bedside of a patient who is in no immediate danger may necessitate giving up an emergency case where prompt action is necessary. Physicians commonly are able to effect a compromise as to the time they shall meet but someone is almost always discommoded through the necessity of such a consultation.

With the increasing number of specialists and the stricter limitations of their work, each within his own specialty, there is increasing confidence between practitioners whether doing general or highly specialized work, and as a result, while far more patients are being seen by two or more physicians, actual bedside consultations are diminishing in number, at least relative to the total number of cases that are referred. Most physicians have friends in various specialties, to whom they willingly send patients for examination and opinion. The consultant, either by telephone or in writing, communicates his findings to the doctor who originally had the case. The patient may be sent to one or many consultants and at the end of the round of visits the original physician, having reports from all his allies, is in a position to correlate the various findings and to give instructions that should cover every phase of the case. No longer need he be afraid, as he was so often in past years, to refer his patients to others who have special training and special opportunity along certain lines. No longer need he feel the necessity of being on hand. Old time practice required that the consulting physician should make his examination and then give an opinion, not to the patient or the patient's relatives, but only to the first physician who in turn communicated with the patient or his family, acting as spokesman for all who had participated.

At present most doctors who refer patients to a consultant instruct the latter to give to the patient any opinion within his own special field he may care to give concerning his own findings. The secrecy and mystery surrounding the old time consultation have largely disappeared and in their place frankness is the rule. This is as it should be, albeit it occasionally results in mishap. Most consultants possess sufficient discretion to think before they talk and to recognize that the physician who originally had the case has rights which must be respected. And, on the other hand, they recognize that they, too, have rights, that the consultation quite likely has been requested by the patient rather than the original physician and that the patient is entitled to receive a first hand opinion from the consulting doctor. A somewhat better plan, which tends to work out to mutual satisfaction of physician and consultant, is one in which, after examinations are made, the examiners compare notes, after which each one states his version. This proceeding is conducive to the establishment of greater confidence on the part of patients than was the old time method, whereby they often felt they were not receiving full benefit from consultants' services and that the doctors were concealing differences of opinion and were more interested in protecting one another than they were in the patient's welfare.

DETERMINATION OF SEX

The question of the origin and determination of sex has been discussed throughout the life of man. Many diverse and some grotesque theories have been proposed by physicians, scientists and laymen in an attempt to explain the production and control of the sex. Notwithstanding the volumes written on this question and the many explanations propounded, none has been accepted as thoroughly explaining the problem. Yet, consideration of it is perpetual and the physician is constantly besought by prospective parents anxious to learn whether regulation of sex is possible. Hence one views with interest a new theory, regardless of its source, with the thought that something suggestive may be offered.

Jackson,* a lay worker, proposes a theory, explaining the excess of one sex over another which he believes has been verified by a series of observations. The principle is that the "sex potential" which predominates in either individual at the time of conception determines the sex of the offspring. This sex potential is diminished through the influence of sunshine and is increased by living indoors or away from the light of the sun. Many observations confirming this theory are presented. For instance, he cites a group of nursery men, whose days are spent chiefly in the sunlight, in whose families appears an excess of girls, attributed to the suppression of the male sex potential resulting from exposure to the sun. An interesting confirmation is offered from the experience of coal miners. It was noted that in certain sections during normal conditions, the miners spending nearly all their days under ground, their families presented an excessive percentage of boys. In this case the male sex potential predominated as it was not suppressed by sunlight. Then followed a prolonged strike, during which the miners were constantly out of doors. The children born during this period numbered a large excess of girls, the sex potential of the fathers having been suppressed by outdoor life with its sun exposure. The author collects a large list of men following a variety of indoor occupations, whose families consisted only of boys or in which they were in great majority, and in contrast is offered a group of men following outdoor occupations, where the children were all girls or they were greatly in excess. He discusses various aspects of this problem, all based on the principle above mentioned. He speculates on the physiologic explanation for these phenomena, offering his views as to the factor regulating the sex potential, but it is desired herein only to call attention to the theory propounded with the illustrations presented. If one is interested in the study of the sex problem, this author offers an explanation which might elicit thoughtful consideration with possible efforts at verification.

THE STATE INDUSTRIAL ACCIDENT COMMISSION

The Oregon State Medical Society, through its Committee on Public Policy and Legislation, has issued a questionnaire to its members entitled, "Industrial Accident Work Survey," for the purpose of obtaining reliable first hand information from physicians throughout the state as to conditions surrounding industrial accident work in their localities. For several years there has been much protest over the activities of the State Industrial Accident Commission and many complaints of discrimination and unfairness have been made. The survey now being started is not an attempt to attack the workings of the commission with a bludgeon. It is being made in no acrimonious or condemnatory spirit, but is an attempt to reach just conclusions, based on fact rather than on hearsay evidence, so that the committee may suggest needful improvements and thereby aid in establishing the maximum of peace and contentment among the doctors of the state.

From the inception of state industrial accident commissions, not only in Oregon but wherever they have come into existence, there has been considerable criticism of their activities. Criticism is not surprising in view of the newness of such commissions and the fact that they have more or less disrupted old established plans. Indeed, it seems inherent in the very nature of the subject. Fundamentally, there is no reason why the state should minister to its sick or injured citizens, except those who are indigent, than that it shall supply groceries or clothing at a cost below that charged by privately operated stores. State industrial accident commissions are manifestations of a kind of socialism. Doctors tolerate them not only because they are to a certain extent helpless, but because their sympathies are with the unfortunate who has insufficient means at all times to have proper medical and surgical care. In addition to such care, the state provides compensation for injured workmen which, though often inadequate, is a step in the right direction.

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* Jackson, R. Clay: The Cause and Control of Sex in Human Offspring.

As state industrial accident commissions are at present operated, they work to the disadvantage of physicians. Some of them have accumulated huge sums of money which is either locked up as a kind of insurance or which may eventually be expended for state operated hospitals, or in any one of a number of ways that may be suggested to or by the various commissions. It seems probable that the time is not far distant when, if a halt is not called, the state will enter into more pronounced competition with private physicians. Even now it is utilizing the doctors to compete against themselves. That is, though it ostensibly employs and pays them and guarantees that the work shall be fairly distributed among them, allowing the injured workman to select his own physician, the fees paid are often inadequate and far below that which they charge to private patients.

State fees are paid in most cases at certain specified rates, based on visits or office consultations without much regard for the nature of the service rendered in such individual visits or office consultations. For inspection of an inflamed tonsil or a slightly cut finger the youngest physician is paid the same fee that the oldest and best equipped practitioner receives for a visit or office consultation in an important case which presents special difficulties. There must, of course, be some schedule of rates, some base from which to start and this is, as a rule, a visit, a consultation, an operation on a certain part of the body, etc., without much regard for unusual problems encountered in individual cases. The same difficulty is inherent in ordinary practice of medicine, in which the basis of compensation is much the same as in state industrial accident work, only among a small percentage of patients of the more considerate and better type is there opportunity for deviation from more or less standardized rates. If the physician does not like his state compensation, the commission has power to select another physician; and there are always others available, willing and ready to do the work.

Herein is no desire to criticize members of the state industrial accident commissions. As far as the writer's experience is concerned, most of them have been and are fair minded and eager to do only that which is just. But the commissions are dealing with problems new and difficult of solution. To a certain extent they are bound with red tape. Doubtless they are subject to propaganda and submitted to attempts to influence them. Many of their problems can only be worked out by long experience; hence, these comments are less in the nature of criticisms of the members of the various commissions than they are of the details of the laws under which they operate. There are many minor details which can only be worked out by careful investigation made in a spirit of cooperation. The apparent remedy is better compensation and more equal distribution of cases which should be presaged upon an organized survey, with recommendations based thereon, to reach a satisfying solution of a concededly difficult problem. That the Oregon State Medical Society is willing to undertake and is making such a survey is a matter for congratulations not only of Oregon but of the entire Pacific Northwest.*

CONSERVATIVE PHYSIOTHERAPY

Within recent years physiotherapy has become a recognized branch of medical practice. An increasing number of medical schools from year to year have added this to their teaching curricula. The recent American Medical Association report of hospitals showed a good proportion which have established physiotherapy departments. While the benefit from this form of therapy is recognized in suitable cases, there is danger of an excess of enthusiasm which may employ it improperly. Familiarity with the principles involved and experience obtained from its practical application in condition of disease, combined with careful diagnosis of the cases to be treated, are essential for successful employment of this form of therapy.

One possibility of bringing into bad repute this form of practice lies in the excessive zeal of the manufacturer's agent who attempts to stampede the prospective purchaser of apparatus, inexperienced in its use and application, into the belief that his wares are essential for successful future practice. One of the most marked offenders along this line has been the representative of a large eastern manufacturing establishment, who is accustomed to select a compliant physician in a given city, whose office he equips with apparatus. The physician provides him with a list of prospective patients who in due time receive a letter, purporting to come from the manufacturer concerned, exploiting the therapeutic value of physiotherapy in general and his forms of apparatus in particular, accompanied by a pamphlet detailing the conditions of disease which it will alleviate or cure. The information is completed by the enclosure of the physician's card who is recommended as an expert in this line of practice. When in course of time the patient appears, thinking he is suffering from a suitable disease, he is referred for treatment to the physician's technician who proves to be the manufacturer's agent, serving the double purpose of treating the patient and instructing the doctor in the details of technic, thus helping to develop the latter as a specialist in this line of practice. By agreement the receipts are divided fifty-fifty between the physician and the account for apparatus. These details are cited from facts that are actually occurring as illustrative of methods which may be employed that are calculated to bring into disrepute a valuable method of practice. When employed in a conservative and ethical manner, however, it is to be commended for the relief of human suffering. It is recognized that the specialist is not evolved over night in any line of work but must develop as the result of careful study and experience that follows only from sustained practical efforts.

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* See page 255 for questionnaire of Oregon State Medical Society.

A NEW WOMAN'S JOURNAL

The initial copy has been received of *The Journal,* which is the official organ of the Woman's Auxiliary to the American Medical Association. Regarding the history of the organization, it is stated that it is the result of the establishment by the women of Texas in 1917 of "The Woman's Auxiliary to the Dallas County Medical Society." The doctors' wives organized to foster friendship and good will among the families of the profession. Following the example of the state medical association of Texas, the women organized thirty-six auxiliaries in the different counties, cooperating with clubs and bureaus of various characters which promote the welfare of the citizens of the state. In 1922, at the meeting of the American Medical Association in St. Louis, a resolution presented from the Texas Auxiliary was endorsed by the House of Delegates, that a Woman's Auxiliary be formed. Nine states followed the suggestion of organizing state auxiliaries. The endeavor of this organization is to promote dependable health education and to impress upon the public a proper conception of the real mission of organized medicine, especially in its crusade of preventive medicine. The aim of the auxiliary is to remain a reserve force, endeavoring to do work assigned from time to time, to assist in lightening the burdens of humanity by helping to preserve the health of the people.

MEDICAL NOTES

OREGON

A TYPOGRAPHICAL ERROR. In last month's issue was a reference to a complimentary banquet given Dr. Andrew C. Price by his Portland admirers. The reading should have been Dr. Andrew C. Smith, one of the best beloved physicians in the hearts of all Portland practitioners. A tribute of affectionate regard is hereby extended to him.

UNIVERSITY OF OREGON MEDICAL SCHOOL was represented at the annual meeting of The Federation of American Societies for Experimental Biology held at Ann Arbor, Michigan, April 12, 13 and 14, by Drs. Harold B. Myers, Head of the Department of Pharmacology, Clinton H. Thienes, Assistant Professor of Pharmacology, and George E. Burget, Head of the Department of Physiology. Dr. Myers presented results of research on "The Influence of Morphine Upon the Oestrous Cycle," and "Growth and Fertility of the White Rat." Dr. Thienes read a paper on "The Effect of Posterior Pituitary Extract on Response of Animals to Drugs Given by Mouth."

CLINICAL PROFESSOR OF MEDICINE. Announcement has been made of the recent appointment of Dr. Laurence Selling of Portland, as clinical professor of medicine and head of the department of medicine of University of Oregon Medical School. Dr. Selling graduated from Yale in 1904 and from Johns Hopkins in 1908. After completing his internship at Johns Hopkins Hospital and one year as Rockefeller fellow in Pathology at Johns Hopkins Medical School, he studied two years in Leipzig and Breslau, Germany, specializing in pathology and neurology. He is a member of the medical staffs of Emanuel Hospital, St. Vincents, Multnomah County and the Doernbecher Memorial Hospital for Children and is affiliated with the American Association of Anatomists and the American Neurological Association. During the war he served overseas as head of the neurological department of Base Hospital 46. He has carried on research work in medical and neurological subjects for some years and is the author of numerous articles dealing with those subjects.

CANCER CLINIC RECEIVES GIFT. The Right Rev. Walter T. Sumner, president of the board of trustees of the Good Samaritan Hospital, announced recently that an anonymous friend has made a gift to the institution of from $10,000 to $12,000. The money is to be used for the purpose of installing a deep x-ray therapy apparatus and a laboratory for cancer investigation in connection with the work of the recently organized cancer clinic.

CENTRAL WILLAMETTE MEDICAL ASSOCIATION met at Albany, April 6. Dr. Ralph Matson of Portland gave an illustrated lecture on the diagnosis of tuberculosis in the early stages.

TUBERCULOSIS HOSPITAL TO BE ERECTED. Following a recent visit by members of the Oregon State Board of Control to the site of the proposed new Eastern Oregon Tuberculosis Hospital at The Dalles, it was announced that the actual work of construction will begin not later than May. The first buildings to be erected will consist of a west wing and center section of the administration building.

Another Professional Building for Portland. Contracts have been awarded for the construction of a modern, ten story medical and dental building at Portland. The new structure, which is to be located at the corner of Eleventh Avenue at Taylor Street, will have a garage in connection. Space is also to be provided for a library. It is expected that the building will be ready for occupancy next October.

New County Hospital. Bids have been called for the construction of a new county hospital for Josephine county. The institution will be located at Grant's Pass. Granite and concrete will be used in the structure, which will be two stories in height and fireproof throughout.

Medical Arts Building Planned. Plans are now under way to form a corporation of leading physicians and dentists of Roseburg for the purpose of erecting a medical arts building in that city. The structure is to be located at the corner of Main and Oak streets. It will be three stories in height, the uppper two of which will be devoted exclusively to the use of physicians and dentists.

Attends Maternity and Infancy Conference. Dr. Frederick D. Stricker, Oregon State health officer, attended the annual conference of state directors of maternity and infancy work, which was held in Washington, D. C., April 2-5 under the auspices of the Children's Bureau of the United States Department of Labor. He addressed the members of the conference upon the the subject of maternity and infant work in Oregon. This state has a record of being one of the leading states in the reduction of infant mortality, a lowering of 26.3 per cent having been attained since 1919.

Dr. Olof Larsell, Professor of Anatomy, University of Oregon Medical School, was granted a leave of absence to present papers on "Cerebellum of Cistudo Carolina" and "The Effect on Respiration of Stimulating the Nerve Terminations in Visceral Pleura," at the annual meeting of the American Association of Anatomists at Ann Arbor, Michigan, April 12.

Joyce Lecture Delivered. Dr. George Eusterman of the Mayo Clinic, Rochester, Minn., delivered the annual Joyce lecture on surgery efore the Portland Academy of Medicine, April 10.

Dr. P. L. Heitmeyer, recently intern at the Good Samaritan Hospital at Portland, has located for practice at Medford, where he will be associated with the Southern Oregon Clinic.

Dr. M. C. Finley of Salem is convalescing from an operation which he recently underwent at St. Vincent's Hospital, Portland.

Golf Victors. A group of medical golf enthusiasts from Seattle locked horns with contenders in this ancient sport at Portland, April 5. They came inspired with zeal and determination to win scalps. They were not equal to the medical webfooters, however, who trimmed them to a score of 65 to 26. Nevertheless they expressed themselves as delighted with the cordial Portland reception and good-fellowship prevailing. At the return engagement in Seattle the Siwashes will hope to turn the tables.

New Professional Building. A new medical and dental center on the East Side in Portland has been created by the completion of the Weatherly Building, the upper floors of which are to be rented exclusively to physicians and dentists.

Dr. Gordon B. Leith, formerly of the faculty of the Pekin Union Medical College at Pekin, China, has located for practice in Portland.

Faker Found Guilty. Benjamin Goldberg, who also goes under the nom de plume of "Professor Kembritz" was recently found guilty of practicing medicine in Portland without a license. He was sentenced to serve sixty days in jail and to pay a fine of $250.

Dr. Joseph B. Bilderback, head of the Department of Pediatrics of the University of Oregon Medical School, is traveling in Europe, combining business and pleasure. He plans to take graduate work in some of the European medical centers.

Dr. and Mrs. Raymond Jones have moved to Redmond, where he has opened an office.

Clatsop County Medical Society held a joint meeting with the staff of St. Mary's Hospital of Astoria April 11 at the hospital. Dr. Ray Mattson, of the Portland Open Air Sanatorium, made an address on the subject of "Early Manifestations of Tuberculosis." He also demonstrated to the audience the proper method of conducting a physical examination in cases of suspected tuberculosis.

Coos County Medical Society held its regular meeting at Marshfield, April 6. Dr. Marr Bisaillon of Portland addressed the members on "Differential Diagnosis of Early Tuberculosis."

Jackson County Medical Society held a meeting at the home of Dr. R. W. Sleeter in Medford, April 18. An illustrated lecture upon "The Early Diagnosis of Tuberculosis" was delivered by Dr. Ralph C. Matson of Portland.

Lane County Medical Society met at Eugene, April 20. Dr. G. C. Bellinger, Superintendent of the State Tuberculosis Sanatorium at Salem, made an address on the subject of tuberculosis.

WASHINGTON

Mental Hygiene Meetings. The recently organized Washington Society for Mental Hygiene sponsored a public meeting April 15 at the Women's University Club, Seattle, for all persons interested in the social aspects of psychiatry. Dr. George K. Pratt of New York, assistant medical director of the National Committee for Mental Hygiene, delivered an address on "Mental Hygiene of Everyday Life." He also addressed the members of the King County Medical Society upon the same subject at a meeting April 16.

Washington Society for Mental Hygiene has established offices at 823 White Bldg., Seattle, and intends to initiate a vigorous statewide educational campaign in the near future. Dr. D. A. Nicholson of Seattle is president of the association, and Miss June Joslin, formerly of New York, is executive secretary.

COUNTY HOSPITAL URGED. At a recent meeting of the Grays Harbor Realty Board at Hoquiam, County Commissioner S. K. Bowes proposed the sale by Grays Harbor County of the Aberdeen General Hospital, and the construction of a new county hospital at Elma. The new institution would be located upon ground adjacent to the Oakhurst Sanatorium, where it would relieve considerably the overcrowding now existing there.

HOSPITAL FOR SEDRO-WOOLLEY. Physicians of Sedro-Woolley, at a meeting of the Chamber of Commerce April 5, presented a plan for the organization of a city hospital. The proposed hospital, it was estimated, could be erected at an approximate cost of $40,000.

HOSPITAL EXECUTIVE A VISITOR. Dr. Bert W. Caldwell, executive secretary of the American Hospital Association, was a recent guest of the executives of the various Tacoma hospitals. He is making a tour of the Pacific Coast for the purpose of making a study of hospital development.

HOSPITAL ENLARGED. A new surgery and an examination room have been recently added to the Ione Hospital, which is operated by Dr. C. M. Canning.

BLAKE HOSPITAL at Darrington has been leased to the Industrial Clinic of Everett, Inc., of which Dr. William F. West is president.

CULTIST'S DEATH CERTIFICATE QUESTIONED. Seven Whatcom County physicians were present at an autopsy performed April 11 in order to ascertain the cause of death of the two year old daughter of Mr. and Mrs. Roy M. Crump of Bellingham. Death had been ascribed to "false croup" in a certificate signed by W. P. Darst, Bellingham chiropractor and sanipractor. The postmortem examination was ordered by County Coroner N. Whitney Wear and was performed with the assistance of Dr. Marion Le Cocq, Whatcom county physician and Dr. I. W. Powell, city health officer. Although the report of the State health department, to which specimens obtained at autopsy were sent, did not give conclusive evidence, it was the consensus of opinion of the physicians attending the autopsy that the child's death was due to laryngeal diphtheria, and that the fatal outcome might have been averted by prompt intubation or tracheotomy. Darst at first refused to allow Dr. Powell to take the throat culture, but later complied with the health officer's request.

ANNEXATION URGED AS HEALTH MEASURE. At a recent mass meeting of residents of the territory immediately outside the northwest city limits of Seattle, Dr. C. L. Dixon, health officer of King County, described the sanitary condition of this district as a menace to health. The population of the district is estimated at 20,000. Dr. Dixon pointed out that there is a potential danger of a typhoid epidemic. He recommended either annexation of the territory by the city of Seattle or the formation of an independent drainage district. The question of annexation is to be considered by residents of the affected district at an early date.

PUBLIC HEALTH APPOINTMENTS. Surgeon L. D. Fricks, medical director of the United States Public Health Service for the Sixth District, has announced changes in the personnel of the service for the coming season. Dr. John H. Graff, formerly of the Coast Guard cutter Haida, has been assigned to the Marine Hospital at Port Townsend. His place on the Haida will be taken by Dr. A. P. Campbell. Surgeon F. H. McKeon, medical officer in charge of the Marine Hospital at Port Townsend, will be assigned to duty in St. Louis. He will be relieved by Surgeon O. H. Cox of Porto Rico.

PHYSICIAN'S SON KILLED. Aviation Cadet James S. Henderson, son of Dr. John M. Henderson of Seattle, was killed last month when his airplane collided with another at an elevation of 9000 feet. The pilot of the other plane landed safely by the aid of his parachute.

MEDICAL GOLF MEET. Physician golf enthusiasts of Seattle were hosts April 22 to sixty professional colleagues from Vancouver and Victoria, B. C., at an intercity meet at the Broadmoor Golf Club. The match was in charge of Dr. D. H. Houston.

ELECTED HEALTH OFFICER. The city council of Grandview has elected Dr. Henry Storgard of Yakima to the position of city health officer.

INSURANCE POSITION RETAINED. Dr. E. L. Kimball of Spokane, medical advisor of the Western Union Life Insurance Company for the past eleven years, will retain his present position, according to officers of the Sun Assurance Company of Canada, which recently purchased the local company.

NOTED SURGEON SPEAKS. Dr. George B. Eusterman, of the Mayo Clinic, was the guest of the Spokane Medical Society April 12. He delivered an illustrated lecture upon the surgical aspects of diseases of the stomach.

LEWIS COUNTY MEDICAL SOCIETY entertained the druggists of Centralia and Chehalis at a dinner and meeting at the Lewis-Clark Hotel at Centralia April 9. There was a general discussion of ways of improving the relationships between the two professions.

DR. T. NORLANDER, a graduate of Rush Medical College, has taken over the practice of Dr. E. A. Lien at Omak.

DR. J. E. DRAKE of Spokane, medical supervisor of the Spokane public schools, recently underwent a serious operation at the Sacred Heart Hospital.

DR. H. E. O'NEAL of St. Louis, Mo., has purchased an interest in the practice of Dr. H. H. Quaife at Kelso.

MEDICAL WEDDING. Dr. Frederick Epplen of Seattle and Miss Ruth Merrill of Spokane were married at Seattle April 2.

IDAHO

Physicians Credit Association. The physicians of Twin Falls have organized a Credit Association, the incorporators being Drs. H. N. Leet, H. E. Lamb, J. H. Murphy, C. D. Weaver and J. N. Davis. Its purpose has to do with compiling rates, making collections, holding assignment accounts, bringing legal actions and other activities such as a corporation of its character may legally perform.

Cornerstone Laid. Under the auspices of the Grand Lodge of Masons of Idaho, the cornerstone of the new addition to St. Luke's Hospital at Boise was laid with appropriate ceremonies April 11. Funds for the new structure were raised in a state-wide campaign under the direction of Bishop Middleton S. Barnwell, of the Episcopal Church of Idaho. The building will be completed in July.

Spotted Fever Appears. Five or six cases of spotted fever were reported in the early part of April by physicians practicing at Mountain Home. This is considered an unusually early time for the annual appearance of the disease.

Part Time City Health Officer. The city council of Sandpoint recently voted to provide the services of a part time city health officer. Mayor Brown has appointed Dr. F. F. Wendle to the position.

New Health Officer. The county commissioners of Camas County have appointed Dr. A. G. Sheets of Fairfield as county physician and health officer.

Nez Perce County Medical Society held a meeting at Lewis and Clark Hotel in Lewiston March 24, at which an address upon the subject of diseases of the nasal accessory sinuses was made by Dr. Stephen Brazeau of Spokane, Wash.

Elected President. Dr. F. B. Brewer, medical officer in charge of the United States Veterans' Hospital at Boise, has been elected president of the Boise Rotary Club.

Dr. Emily Balcolm, formerly connected with the department of public health at the University of California, Berkeley, Calif., has been appointed director of the state bureau of child hygiene of Idaho.

Dr. George Gaignard of Culdesac has been confined by a severe illness at St. Joseph's Hospital, Lewiston.

Dr. N. R. Wallentine of Sandpoint sailed for Europe April 10. He expects to return in May.

OBITUARIES

Dr. William A. Wright, Pocatello, Ida., one of the most prominent surgeons of Southern Idaho, died suddenly at his home April 6, aged 40 years. He had been suffering from poor health for over a year. He was born in 1877 at Laramie, Wyoming, and graduated from Rush Medical College, Chicago, in 1901. He located at Pocatello soon afterward, and served as division surgeon for the Oregon Short Line Railroad until 1921. At one time he was surgeon-general of the Idaho National Guard under Governor Brady.

Dr. John H. Sheets, Buckley, Wash., died suddenly in his automobile March 24, aged 70 years. He was born in Grass Valley, Calif., in 1858, and graduated from the University of California Medical School, San Francisco, in 1881. In 1882 he located in Carbonado, Wash., where he remained for two years, later moving to Buckley. He remained in active practice there until the time of his death. He was a member of the Washington State Legislature from 1905 to 1909, and also served terms as a member of the Buckley city council and school board and as mayor.

Dr. Harrison A. Wright of Seattle died April 21, aged 68 years, after a prolonged period of illness. He was born in Prescott, Wis., and later removed to Oregon. He graduated from the University of Oregon Medical College in 1888. He practiced in Northern California and Oregon with headquarters at Klamath Falls, Ore. In 1900 he located at Wilbur, Wash., moving to Seattle in 1907. He served for a number of years on the State Board of Medical Examiners. He was much interested in breeding Guernsey cattle and devoted much time to a farm on Lopez Island.

Dr. Eldred B. Waffle, Astoria, Ore., died suddenly in his office April 23, aged 48 years. He was born in Lodi, Wis., in 1879 and came to Oregon when a young boy. He attended the University of Oregon Medical School, Portland, Ore., graduating in 1908. After two years study in Europe he located at Astoria, where he remained until his death. During the world war he served overseas with the La Grande field hospital unit of the Forty-second division, in which he attained the rank of captain. He was active in the American Legion and was at one time a school director of Astoria.

Dr. Ivan Balabanoff, Tacoma, Wash., died suddenly at nis home April 22, aged 73 years. He was born in Bulgaria in 1855 and came to the United States in his early manhood. He graduated from the New York University Medical department, New York City, in 1887, and located in Tacoma in 1888. He practiced there continuously until the time of his death, his practice in his late life being confined to otolaryngology and rhinology.

Dr. D. J. McFaul, Pendleton, Ore., a veteran practitioner of Eastern Washington, died at Pasadena, Calif., April 20, following a protracted illness, aged 63 years. He was born in Canada in 1865, and graduated from the Detroit College of Medicine and Surgery, Detroit, Mich., in 1888. He practiced for several years at Heppner, Ore., later moving to Pendleton.

Dr. Marion F. Setters, Spokane, Wash., died at his home April 6, following a brief illness, aged 57 years. He was born in 1870, and graduated from Denver College of Medicine, Denver, Colo., in 1897. He practiced for a short time at Harrington, Wash., moving to Spokane in 1901. He continued in active practice in that city until his death.

Dr. Malcomb H. Nicholson, Seattle, Wash., died at his home April 25, aged 70 years. He was born in

Nova Scotia in 1857, and graduated from New York University Medical College, New York City, in 1888. He was one of the early settlers of the Ballard district of Seattle, where he practiced continuously until his death.

Dr. G. A. Pogue, Ontario, Ore., died at his home April 9, following an illness of several years. He was a graduate from the Kentucky School of Medicine, Louisville, Ky., in 1879. He was the first physician to locate at Ontario, and continued in active practice there until forced by failing health to retire.

INDUSTRIAL ACCIDENT WORK SURVEY OF OREGON STATE MEDICAL SOCIETY

Dear Doctor:

The Committee on Public Policy and Legislation is making a study of the medical provisions of the State Workmen's Compensation Act as well as the administration of the law as it affects physicians.

The committee desires to obtain first-hand information from physicians throughout the state as to the conditions surrounding industrial accident work in their localities. We will, therefore, greatly appreciate your filling out the enclosed questionnaire and mailing it to the Society office.

You are urged to do this at once as the committee will be unable to suggest needed improvements if physicians fail to report present conditions.

Fraternally yours,
Committee on Public Policy and Legislation.
E. B. McDaniel, Chairman
Ralph A. Fenton
Wilson Johnston
Roy S. Stearns
Joseph A. Pettit
Hugh S. Mount
L. B. Bouvy

Questionnaire

1. (a) Is there a fairly even distribution of industrial accident work among physicians in your locality who desire to do such work?

(b) If not, what, in your opinion, is the reason?

2. (a) Is any of the industrial accident work in your locality done under contract?

(b) If so, to what extent, in your opinion, is this work contracted to:

(1) Physicians ....

(2) Hospital associations ....

3. At what rates are physicians who care for cases under contract to hospital associations paid?

4. (a) Are you now doing a smaller amount of industrial accident work than formerly?

(b) If so, to what do you attribute this?

5. (a) Are industrial accident cases in your locality hospitalized as nearly as possible at the point where the accident occurs?

(b) If not, what, in your opinion, is the reason?

6. (a) Do you regard the present fee schedule of the Industrial Accident Commission as adequate?

(b) If not, please specify the fees which you regard as too low:

7. (a) Does the industrial accident commission apply the fee schedule fairly in individual cases?

(b) If not, please specify cases where the schedule was unfairly applied, giving dates and names of patients:

8. (a) Have you had cases under your care taken out of your hands by the Industrial Accident Commission without what seemed to you good cause?

(b) If so, please specify cases, giving dates and names of patients:

(c) Has the Industrial Accident Commission ever suggested that you consult with other physicians before taking cases out of your hands?

9. Please make any criticisms or suggestions that, in your opinion, would aid in improving medical service to injured workers or in bringing about more satisfactory conditions for the physician:

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., E. L. Zimmerman; Secty., C. E .Hunt

A meeting of Central Willamette Medical Society was held at Hotel St. Francis, Albany, April 5. The banquet was at 6:30 p. m., at which twenty-seven members were present. Dr. Ralph C. Matson gave a paper on "The Early Diagnosis of Tuberculosis." Clinical cases of tuberculosis were shown and a general discussion of the subject was engaged in by the members.

WASHINGTON

CLALLAM COUNTY SOCIETY

Pres., P. H. Brown; Secty., W. H. Taylor

Clallam County Medical Society held its annual election of officers at a meeting at Port Angeles April 10. Those elected were: President, Dr. W. M. Davidson, Port Angeles; vice-president, Dr. R. S. Hamilton, Port Angeles; Dr. Will H. Taylor was re-elected secretary-treasurer, and Dr. P. H. Brown, Pysht, was chosen as delegate to the annual state medical association convention. Dr. Howard Hull of Elma, supervisor of Oakhurst Sanatorium, spoke on the subject of early diagnosis of tuberculosis.

CLARK COUNTY SOCIETY

Pres., R. D. Wiswall; Secty., A. E. Bird

Clark County Physicians Organize. Physicians of Clark County met April 17 at the Hotel Evergreen at Vancouver for the purpose of completing the organization of the Clark County Medical Society. The election of officers resulted as follows: President, Dr. R. D. Wiswall, Vancouver; vice-president, Dr. A. E. Bird, Camas; secretary-treasurer, Dr. L. E. Hockett, Vancouver. Board of Censors: Dr. C. R. Zener, Vancouver; Dr. R. S. Stryker, Ridgefield, and Dr. Flinn, Washougal. It was determined to hold regular meetings of the society on the second Tuesday of each month. Affiliation with the Washington State Medical Association and the American Medical Association is planned.

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Bldg., Seattle, April 2, President Hall in the chair. About one hundred physicians were present. Minutes of previous meeting were read and approved.

The following were elected to membership in the society: Drs. H. C. Christopher, E. E. Grant, W. D. Hunt, J. J. Markey and P. T. Ratigan. Applications for membership were presented from Drs. M. W. Clein and P. W. Spickard.

Dr. C. S. Leede presented a case of hemochromatosis. Regarding treatment with hypertonic salt solution, suggested by Dr. Takacs, the speaker stated he believed iron was too well fixed in the tissues to be affected by isotonic salts.

Dr. W. B. Penny of Tacoma gave an address on publicity as executed by Pierce County Medical Society. He described measures adopted for newspaper publicity and discussed the controversy with the telephone company as to the publication of members' names. *Hygeia* is distributed to schools and libraries. Health articles appear daily in the Tacoma Times. Suggestions from laymen are encouraged in public hospital staff meetings. Moving pictures are employed for the promotion of general interest. Relations of the society to the Better Business Bureau were discussed. The two organizations work in harmony in the suppression of impostors and fakers. Discussion followed by Drs. H. A. Davidson and A. O. Loe.

Mr. George Kahin, representing the Better Business Bureau of Seattle, stated that no cooperation had been received from this society during the seven years of the Bureau's existence. He mentioned the locations of these bureaus in the leading cities, and described their successful efforts in the suppression of illegitimate and fraudulent advertising, and the publicity which they secure in exposing quacks, fakers and other impostors. The Better Business Bureau offers advice to all inquirers concerning investments and other matters of financial interest. A motion was adopted for the appointment of a committee to confer with the Bureau regarding a membership in it from the society.

A meeting of the Surgical Section of the Society was held April 16 with Dr. M. W. McKinney in the chair.

Dr. H. C. Olmsted presented autopsy specimens of the lungs and kidneys of an infant whose death followed general pyemia with multiple abscesses, originating from bilateral suppurative otitis media.

Dr. C. E. Hagyard read a paper on "Chronic Cholecystitis," which is the most common abdominal disease and the prime cause of recurring and chronic dyspepsia. Its etiology is inflammatory, derived from hematogenous and lymphatic sources. Symptoms of the disease were enumerated and the two distinct types of the chronic form were differentiated. The different tests for diagnosis were presented. Duodenal drainage is of questionable therapeutic value. Cholecystectomy is the operation of choice unless definitely contraindicated. Illustrative cases were recited. The paper was discussed by Drs. G. C. Miller and O. F. Lamson.

Dr. George K. Pratt, of New York, Assistant Medical Director of the National Committee of Mental Hygiene, gave an address on "The Relation of Psychiatry to Modern Medicine." He discussed the study of human behavior and its relation to society. He gave a historical review of insanity as conceived in past ages, and as contrasted from the modern viewpoint. Mental hygiene is chiefly concerned with mild cases that do not constitute an institutional problem. Preventive measures must begin the plastic period of a child's life. Abnormal behavior has always a definite underlying reason, for which the psychiatrist rarely searches in vain. An educational campaign is necessary to accomplish results, similar to that which has been so successfully waged in the fight against tuberculosis.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. C. Wheeler; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at the Pierce County Sanatorium, at Lakeview, March 27. The clinical meeting was preceded by a dinner at 7 o'clock, attended by about seventy members.

The program consisted of a demonstration of artificial pneumothorax technic by J. M. Odell and a demonstration of complete chest examination and x-ray films of various phases of chest pathology by Dr. J. F. Steele. Several pneumothorax and two thoracoplasty patients were also presented

SPOKANE COUNTY MEDICAL SOCIETY

Pres., P. J. Gallagher; Secty., R. M. Schulte

A regular meeting of Spokane County Medical Society was held April 12.

Dr. Geo. B. Eusterman, of Mayo Clinic, read a paper on "The More Infrequent Lesions of the Upper Digestive Tract." He discussed duodenal cancers, duodenal ileus, duodenitis, sarcoma of the stomach, benign tumors of the stomach, and gastric syphilis.

The question of liability insurance was discussed with the Council and a committee was appointed to investigate the relative merits of the companies writing this coverage.

The Society appointed a corps of speakers to address all schools on Health Day, May 10, during boys' and girls' week.

THURSTON COUNTY SOCIETY

Pres., J. F. Gibson; Secty., W. E. Steele

Thurston County Medical Society and the staff of the Shelton General Hospital held a joint meeting at the hospital in Shelton, April 19. Dr. H. J. Wyckoff of Seattle made an address on "The Present Status of Infantile Paralysis."

WHATCOM COUNTY SOCIETY

Pres., L. P. McCalla; Secty., W. B. S. Thomas

Whatcom County Medical Society held its regular monthly meeting at Bellingham April 2. Dr. L. P. McCalla, president of the society, occupied the chair. Papers dealing with the subject of goiter were read by Drs. S. H. Johnson and W. C. Keyes. Plans were laid to hold the next meeting of the Tri-County Medical Association at Bellingham in May or June.

WHITMAN COUNTY MEDICAL SOCIETY

Pres., D. T. Ford; Secty., J. E. Preucel

The annual meeting and election of officers of Whitman County Medical Society was held in the lecture room of St. Ignatius Hospital, Colfax, Tuesday evening, April 10, 1928. The meeting was called to order and presided over by Dr. W. A. Mitchell at 7:45 p.m., Dr. Ford, the president, arriving at 8:15 and taking his place.

The following officers were elected for the ensuing year: President, Dr. D. J. Leuty, Farmington; Vice-President, Dr. R. J. Skaife, Colfax; Secretary and Treasurer, Dr. J. Edward Preucel, Colfax.

Under the scientific program, Dr. Edgar N. Layton, who was delegate to the Washington State Association meeting in 1927, gave a report and talked on his observations of the surgical program. He especially reviewed some of the instructive points brought out by Dr. Dean Lewis.

Dr. Paul G. Weisman, of Colfax, presented a well prepared and instructive paper on "Liver and Gallbladder." Dr. F. A. Bryant stressed some important phases of the paper, the chief point being when to and when not to operate in liver and gallbladder disorders.

"Acidosis, Physiological Chemistry of the Bile and Cholestrine" was discussed by Drs. Ford, Palmer, Preucel and Weisman.

At the close of this well attended and instructive meeting, Sister Rosula, Superintendent of Nurses, gave the doctors a surprise in the form of an excellent lunch.

The following reminder of society meetings is employed by the secretary:

WHY A MEMBER?

Membership is Important—Stick to It

Stick to your County Medical Society. Attend meetings if you can, but even if you are not able to attend all the meetings, your *membership* connects you to the *State Medical Association* and the *A. M. A.* It puts you in a higher esteem in the eyes of your friends, your patients and the public in general. You will profit by sticking to it.

J. EDWARD PREUCEL, M.D.
Secty. and Treas., Whitman County Medical Society.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

MODERN METHODS IN THE DIAGNOSIS AND TREATMENT OF RENAL DISEASES. Modern Medical Monographs. Edited by Hugh Maclean, M.D., D.Sc., F.R.C.P. Professor of Medicine, University of London, etc. Third Edition, Revised and Enlarged. With Four Colored Plates. Pp. 135. $2.75. Lea and Febiger, Philadelphia and New York. 1927.

This is a very practical, plain and authoritative little treatise on nephritis and the classification is of the simplest: acute, interstitial and parenchymatous nephritis; or azotemic or hydremic nephritis, in place of the last two forms. As the writer says in the preface, the more complicated classifications may be of interest to the expert but they only confuse the inexperienced. In fact, it has seemed to the reviewer that the degree of confusion affecting a large percentage of the profession is chiefly due to the use of so many different terms for the same disease. Thus glomerular nephritis is spoken of as parenchymatous nephritis by leading authorities, and yet it is usually interpreted as meaning nephritis with high blood pressure and without edema, whereas parenchymatous nephritis is most commonly used to denote tubular nephritis or nephritis with edema and without hypertension.

The author affirms that the normal range of blood urea varies from 20 to 40 mgm. per 100 c.c. of blood, a higher range than often stated and yet probably nearer the normal. He shows that very high amounts of blood urea may be present without any disease of the kidneys, as when it is as high as 100 with the presence of albuminuria in the case of abdominal abscess. He points out that sweating profusely and abstention from water and diarrhea may cause a high blood urea in normal persons; that intercurrent diseases, as pneumonia, cardiac lesions, intestinal obstruction, fevers, and empyema especially are responsible for high blood urea in those without nephritis. The author determines the significance of high blood urea by checking up the urinary area-content, and finds that a percentage of urinary urea over 2 per cent rules out uremia.

Among other tests of renal function the author relies much on the urea concentration test or a test showing the ability of the kidneys to concentrate urea when 15 gm. of urea are given by the mouth. He has used the test in over 10,000 patients with varying degrees of nephritis and believes it of more value than any other. The writer is evidently less familiar with the phthalein test, as he states the normal findings should be 60 to 85 per cent in two hours, and when the kidneys are moderately diseased about 50 per cent of the dye is eliminated in two hours. Rowntree has written the reviewer that, when the dye is given intramuscularly, the minimum normal elimination in two hours should be over 40 per cent, and when given intravenously it should be above 50 per cent. The writer objects to the test chiefly because it requires the use of a colorimeter. On the other hand, the writer makes no mention of the most simple test of the power of the kidneys to concentrate urine by taking the specific gravity after abstention of the patient from water for sixteen hours. In the routine examination of the patient for renal trouble the author estimates the blood urea and gives urea by the mouth.

The remarks on albuminuria are very interesting. Out of 60,000 men examined in the English army 3,000 had albuminuria, and in 3 per cent of these the albuminuria was very marked. The urine was passed on rising, so static albuminuria was apparently excluded. Exercise increased the percentage of albumin from 7 to 14 per cent in 200 men. Hyaline and granular casts occurred in these urines, especially with large amounts of albumin, but the patients showed no renal symptoms and renal function tests were normal.

From the author's large experience he deduces that albuminuria is not at all rare and up to the age of 40 or 45 may be of no pathologic significance. The reviewer has followed cases for 20 years and has found that the albumin disappears with middle age.

The chapter on treatment is conservative and sensible like the rest of the book. In parenchymatous nephritis or nephritis with edema urea is given as a diuretic and high protein diet (120 to 200 gm. per diem).

The recent term "nephrosis" the author ridicules as a confusing resuscitation of a name long ago discarded.

In uremia morphine and venesection are advised. Pilocarpine is recommended but it has always seemed as if sweating was contraindicated, in that it concentrates urea in the blood, although urea is not the original cause of uremia. The little handbook may be heartily recommended to the general practitioner as a relief from much of the writing about nephritis nowadays that obscures rather than illuminates the subject.

WINSLOW.

BRAIN AND MIND or The Nervous System of Man. By R. J. A. Berry, M.D., F.R.C.S., F.R.S., Edin.; Dean of the Faculty of Medicine and Prof. of Anatomy, University of Melbourne. 608 pp. The Macmillan Co., New York, 1928.

The author has endeavored to show "that the manifestations of the healthy mind result from combinations of brain cells, and that if from any cause whatsoever these cells are deficient in numbers, or are in an unhealthy condition, aberrations of the mind will probably result." He has succeeded well in this enormous undertaking. The text is much simpler and more clearly defined than in the usual neurologic works. Explanations are brief and to the point. Anatomy, histology, physiology and psychology have been correlated to a nicety. Another unusual feature of the book is that the author starts with the sympathetic nervous system and works up into the more complex structures. This goes toward simplifying the subject greatly.

The book also brings out the importance of knowledge of relation between the structural nervous system, psychology and psychiatry. It shows how each depends upon the other and without knowledge of each branch the physician and educator will meet indifferent success. This work is to be greatly commended.

WILT.

HANDBOOK ON DIET. By Eugene E. Marcovici, M.D. Formerly Assistant to Professor von Noorden in Vienna; Instructor, Post-Graduate Hospital, New York, etc. 323 pp. $3.25. F. A. Davis Co., Philadelphia, 1928.

The author of this book is to be complimented on the accumulation of an amazing amount of data concerning food, its preparation, care and relationship to pathologic entities. The work of European authors like von Noorden and Schlesinger is heavily drawn upon, and their conception of management from a dietetic standpoint is well presented. The details contained are not so extensive as to be burdensome, and one may obtain in a general way the essential facts relative to the use of food in the practice of medicine.

HOFRICHTER.

LOCAL ANESTHESIA. By Geza de Takats, M.D., Assistant Professor of Surgery, Northwestern University, School of Medicine, Chicago, Ill., with an introduction by Allen B. Kanavel, M.D., Professor of Surgery, Northwestern University, Medical School. Octavo of 221 pages with 117 illustrations. Cloth, $4.00. Philadelphia and London: W. B. Saunders Company, 1928.

The increasing popularity of local anesthesia is due partly to a better understanding of its indications and to the frequency with which complications follow general anesthesia. A new book on the subject, when presented in an authoritative manner and based upon a large personal experience, is always of value and in this present volume the author has presented the subject concisely but adequately. He points out how local anesthesia may be used to best advantage; he indicates the best method of administration and tells how complications may be avoided. The work is abundantly and appropriately illustrated.

FORBES.

THE MEDICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume 11, Number 5 (Tulane University Number, March, 1928). Octavo of 261 page swith 35 illustrations. Per clinic year, July 1927 to May 1928. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume contains discussions of many matters of much interest to the medical man. Turner considers the value of the obstetric history in making a diagnosis of syphilis, based upon 388 consecutive cases of negro females, of whom 64, or 11 per cent, gave histories of stillbirths. Of these 33 per cent gave positive Wassermanns. In addition 18 gave definite tertiary syphilis, making 39 with a reasonably clear diagnosis. There was a strong suspicion in 14 other cases, making a total per cent of 83. He calls attention to the value of pregnancy as a test for syphilis, and discusses the theory of the protective influence of pregnancy against tertiary syphilis. He concludes that a history of stillbirth is of great value in diagnosticating syphilis in women. Williford considers the treatment of paresis by malaria,

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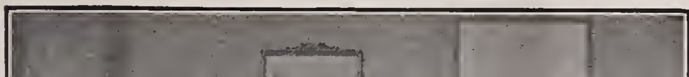

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Sodaku and tryparsamid. He recites the history and discusses results of treatment with malaria. Sodaku, a well known disease in Japan, originating in the infected rat, has proved highly successful. The material for human inoculations consists of citrated blood taken from the heart of an infected guinea-pig or rat. Tryparsamid has been successfully used in certain conditions. The death rate from malaria treatment is 10 per cent, from Sodaku about 3 per cent, which is considered the best treatment in proper hospital surroundings. In general practice the author considers tryparsamid the best drug to be used.

DIABETES. ITS TREATMENT BY INSULIN AND DIET. A Handbook for the Patient. By Orlando H. Petty, A.M., M.D., F.A.C.S., Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania, with Illustrations and Tables. Fourth Revised and Enlarged Edition. 155 pp. $2.00. F. A. Davis Company, Philadelphia. 1928.

The main object of this volume is given as the education for the diabetic in all matters pertaining to his health. Suggestions are offered for the prevention of diabetes, its dietary and insulin control. There are chapters on weighing and measuring of foods, estimation of diet and the tests for sugar in the urine. Insulin is considered with methods for home administration. This volume is not intended as a substitute for the physician but an aid for giving the patient a working knowledge of the treatment of his condition.

GYNECOLOGY FOR NURSES. By Harry Sturgeon Crossen, M.D., F.A.C.S., Professor of Clinical Gynecology, Washington University Medical School, etc. With 365 engravings, including one color plate. 281 pp. $2.75. The C. V. Mosby Company, St. Louis. 1927.

A brief survey of pelvic anatomy is presented in Part I. The details of gynecologic nursing in its various phases are presented in Part II. The volume is profusely illustrated, the steps of various operations being presented in a manner to be self-evident even in absence of the text. The descriptions of abdominal and vaginal operations have every phase of the work of the nurse graphically illustrated, with sufficient description for a vivid presentation of the surgical procedures. With this volume in hand the nurse can obtain many accurate suggestions as to her functions and assistance in the surgery.

ACUTE ASPHYXIA AS MEDICAL PROBLEM. Final control of all the great emergencies causing asphyxia and requiring resuscitation rests with the medical profession, says Cecil K. Drinker, Boston (*Journal A. M. A.*, April 21, 1928). The three great emergencies particularly susceptible to proper treatment are drowning, electrical shock, and carbon monoxide poisoning. The first of these is the most frequent and the second the least. Drowning, so far as is known, presents a relatively simple form of asphyxia. On complete immersion the victim uses up the small amount of oxygen imprisoned in the lungs and goes rapidly on to a degree of generalized oxygen lack, which results in progressive death of the various tiessues throughout the body. In all cases of asphyxia, death should never be admitted until prone pressure artificial respiration has been used for at least an hour. Electrical shock, like drowning, produces a simple form of asphyxia, but, unlike drowning, is practically never suicidal, the shocked person being usually in the best of physical and mental health. The victim of electrical shock may be found in one of several conditions: 1. Respiration may have ceased but the heart and circulation may be normal. 2. Respiration and circulation may have ceased at the same time, the ventricles of the heart being in fibrillation. 3. Respiration may be present and the heart stopped; i.e., as in ventricular fibrillation. Patients of this type, deprived abruptly of circulation, become deathly pale at once. On the other hand, patients in whom the respiration has stopped and the heart continues to beat—favorable conditions for artificial respiration—become cyanotic as oxygen is lost from the circulating blood. If, with artificial respiration, this cyanosis begins to disappear, the operator has encouraging evidence that the circulation is active. Carbon monoxide poisoning from all causes—manufactured gas, automobile exhaust, smoke from fires, the gases from coal heating furnacees—constitutes a slowly increasing hazard. The gassed patient presents a more complex problem than does the victim of drowning or electric shock. Carbon monoxide combines with the hemoglobin of the blood, excluding oxygen from the hemoglobin molecule and causing death by oxygen deprivation. The entire process may be very slow. When death occurs, respiration fails before the heart beat ceases; but if at the time respiratory failure takes place the patient is removed from the gas-laden atmosphere and is given artificial respiration, normal breathing can often be restored.

ANGINA PECTORIS. James C. White and Paul D. White, Boston (*Journal A. M. A.*, April 7, 1928), have performed paravertebral alcohol block on the upper five left dorsal nerves in five patients, and have observed these cases for periods varying from four to thirteen months after injection. The only troublesome complication was the hyperesthesia that appeared in every case as the anesthesia receded. This most annoying symptom varied from a mild hypersensitiveness of the skin over the are of distribution of the injected nerves to distinct soreness on pressure of the clothing and shooting pains with spasmodic twitching of the intercostal muscles. In two cases this condition was as troublesome as the angina pectoris itself for a week or two. The characteristic sequence of events was usually complete numbness for a week, and then loss of anesthesia of the anterior divisions of the intercostal nerves. Within a fortnight the lateral divisions were regaining sensation, and before a month had elapsed all peripheral anesthesia had been lost. When the nerves began to function again they were always hyperesthetic, so that during the period from two to six weeks following the injection each patient was in considerable discomfort. Although anesthesia of the peripheral nerve was lost with relative rapidity, the sympathetic effect, as shown by the contracted pupil, was of prolonged duration (seven months in one case). It would therefore seem that while the alcohol did not have sufficient penetrating power to destroy the heavily sheathed peripheral nerve, it could still produce complete necrosis of the delicate sympathetic rami. The peripheral nerve is probably involved only in a transitory edema from which the central fibers to the anterior divisions recover first and the superficial fibers to the posterior divisions last. The first patient in the series is still doing extremely well at the end of thirteen months. There is no reason for not performing a second injection, and two patients have already asked that it is done in case their severe attacks recur.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

ESSENTIAL THROMBOPENIA

SPLENOGENOUS THROMBOLYTIC PURPURA
THROMBOCYTOPENIC PURPURA

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Attention is being drawn more and more to the need of determining the number and character of the blood platelets in different diseases. Denys (1887) is frequently given the credit for first having noted a marked reduction of the platelets in certain purpuras. It seems that this observation had been made earlier by Brohm (1881) and Krauss (1883), but it did not attract much attention. Hayem seems, however, to have been the first to recognize the etiologic significance of this marked reduction of platelets in purpuras. Frank later differentiated the primary purpuras from cases of hemophilia, scurvy and secondary hemorrhagic phenomena with which they were frequently confused, and gave to the symptom-complex under discussion the name of "essential thrombopenia." Notwithstanding that the reduction of platelets seems to stand in a direct relationship to the hemorrhages from the gums and those into and beneath the skin, the disease has been but slowly recognized and undoubtedly a number of cases have appeared in the literature under names which do not suggest a causal relationship between the reduction of platelets and the hemorrhages.

The protopathic hemorrhagic purpura (essential thrombopenia) of Hayem is characterized, in addition to the gastrointestinal disturbances, by a tendency to continued or intermittent hemorrhages from the mucous membranes or into the skin. The patient may for months or years have daily hemorrhages. Small petechiæ or large ecchymoses may develop spontaneously or after slight trauma. The gums bleed either spontaneously or after the teeth are brushed. While these small hemorrhages are not dangerous, severe hemorrhages may occur without cause and terminate fatally. Nose bleed, hematuria, hematemesis, melena and metrorrhagia, against which the physician may be powerless, may occur. When a tampon which has been applied to control hemorrhage is removed, bleeding may begin again.

According to Hayem five things are characteristic of essential thrombopenia.

1. Absence of any anatomic change in the red cells.
2. Reduction, usually marked, in the number of platelets which may be large (giant platelets).
3. No constant change in the leucocytes.
4. Normal coagulation of the blood.
5. Absence of clot retraction and transudation of serum.

A marked reduction in the number of blood platelets is one of the striking features of essential thrombopenia. Two possibilities as to the cause of this reduction are immediately suggested, (1) either that the platelets are not formed in sufficient numbers, (2) or that they are rapidly destroyed. The thrombocyte or platelet is formed from the megakaryocyte. Some time is required for the development of blood platelets after the bone marrow is injured. Bunting found that in rabbits, after the injection of saponin which injures the bone marrow, it requires fifteen days for the platelets to reach their maximum again. The rapid recovery in the number of platelets following splenectomy would indicate that it is the destruction of the platelets rather than interference with the platelet forming function of the megakaryocyte which occurs in the disease under discussion.

A splenic enlargement, noted in three of the four cases studied by Kaznelson, as well as the enlargement noted in the cases studied by Türk, Trembur, Duke, Hayem, Esmein and others, suggested a causal relationship between changes in the spleen and the destruction of platelets. Experimental evidence is at hand which indicates that the spleen plays a role in the destruction of platelets. Port and Aiyama found that in normal rabbits the platelets were increased after removal of the spleen.

The frequent occurrence of a splenic enlargement in these cases, together with experimental evidence obtained by removal of the spleen, suggested to Kaznelson that altered function of the spleen was the cause of the reduction of platelets which apparently accounted for the hemorrhages in these cases. He had under his care a patient who had had for ten years hemorrhages into the skin and bleeding from the gums. The number of blood platelets remained between 300 and 600 during three and one-half months that the patient was confined to bed. There was not any tendency for the platelets to increase and the clot did not contract when hemorrhage occurred.

Schloffer removed the spleen in this case. The blood platelets fairly jumped in number so that after forty-eight hours they reached 600,000. With an increase in the number of platelets there occurred a rapid increase in the contractility of the clot. Hemorrhages did not recur and those already present gradually disappeared. The anemia gradually disappeared, the patient gained in weight, and gradually resumed her household duties.

The striking clinical improvement in this case suggested a direct relationship between the changes in the spleen, the reduction in the number of platelets and the hemorrhages into the skin and from the mucous membranes. Carbone and Aschoff have found masses of elements in the spleen which are quite identical with platelets.

I have recently removed the spleen in two cases of essential thrombopenia. Short histories of these two cases will be given.

Case 1. E. W. A., a girl, is now eight years old. Shortly after birth this patient had a fever which lasted for some time and then subsided. The cause of this was not determined.

On July 7, 1925, this patient was admitted to the Harriet Lane Home. The history given at this time indicated that the child had had from time to time attacks of abdominal pain, after which tarry stools were noted and occasionally hematuria. The history was also given of rather large ecchymoses beneath the skin, following relatively slight trauma. The child would improve and leave the hospital to return again after varying times with a recurrence of the same findings. Some thirteen transfusions were given during the stay in the hospital.

On the eleventh of November, 1927, this patient was again admitted to the hospital, complaining of attacks of abdominal pain followed by tarry stools. A blood examination made at this time revealed hgb. 35, r.b.c. 1,860,000, w.b.c. 3,960, platelets 85,000. An operation, though advised, was delayed, hoping that some improvement in the general condition might occur.

During the night and morning of the tenth and eleventh of December this patient again had abdominal pain and gastrointestinal hemorrhages with a rather rapid fall in the hemoglobin. A splenectomy was done on the morning of the eleventh of December. Considerable free fluid was found in the abdomen. The spleen was enlarged and the capsule was thick and white. There was, however, no marked perisplenitis.

Hemorrhages stopped after removal of the spleen, and within twenty-four hours the platelets had jumped from 40,000 to 150,000. There have been no hemorrhages since the splenectomy, the platelets have returned to normal and the child appears to be in perfect health.

Case 2. M. E. R., a girl, aged 3 years and 4 months, had the following history. In November, 1926, purpuric spots were noted by the parents on the child's gums and tongue. In December, 1926, she bled freely from the nose and throat. The nose and throat hemorrhages were repeated from time to time. Calcium lactate, gr. 2, were given t.i.d. until May 1, when another hemorrhage occurred from the nose and throat. She vomited at this time a large quantity of blood. Intramuscular injections of citrated blood were then given. On July 1, 1927, while on an automobile trip to Frederick, Maryland, another hemorrhage occurred from the nose and throat. She recovered quickly from this and did well until August 1, 1927, when hemorrhages again occurred from the nose and gastrointestinal tract.

In November she bled from the gums about a loosened tooth. This was extracted; the hemorrhage continued for one or two days. Considerable trouble was experienced in controlling this hemorrhage.

A blood examination made late in December was as follows: Hgb. 61, r.b.c. 3,552,000, w.b.c. 13,500, platelets 40,000, bleeding time seven and one-quarter minutes, clotting time three minutes.

A note made on February 5, 1928, showed 22,000 platelets. The spleen was not palpable in this case. On February 8 a splenectomy was performed. The spleen was not markedly enlarged and seemed to be practically normal on gross examination. Six days after operation the platelets numbered 350,000 and on the 26th they numbered over 700,000. Bleeding time had been reduced to one and one-half minutes.

These patients must be observed for some time to determine whether they are cured, for the disease seems to have in some cases an intermittent course.

In discussing the surgical treatment of essential thrombopenia, two types are differentiated, the chronic and acute. Statistics would indicate that the acute cases have not been so amenable to surgery as the chronic. The acute cases may run a fatal course, they may recover spontaneously, or may become chronic. Consequently it is difficult to define what is an acute case. Those cases, which have had a tendency to bleed, have remained well for a time and then have had a severe acute hemorrhage, have been spoken of as acute cases. But not infrequently such an onset is the beginning of a chronic case.

The entire reticuloendothelial system may be involved in this symptom-complex and Engel believes that the acute cases have a different etiology than the chronic. It should be remembered that thrombopenia is a symptom. This should not be regarded as an indication for operation, but the history and clinical findings should be considered in determining the type to be operated upon.

It is probable, judging from certain bone findings which have been described, that we must recognize a myelogenous and splenogenous type of the disease. One part of the reticuloendothelial system may be involved more than the other. The failure to cure in some cases is probably due to the fact that the spleen is not primarily and predominantly involved.

Removal of the spleen in most of the cases of essential thrombopenia is followed by a striking increase in the number of platelets, a rapid cessation of hemorrhages and a marked improvement in the general condition of the patient.

ACUTE PANCREATIC NECROSIS

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Acute pancreatic necrosis, more commonly called acute hemorrhagic pancreatitis, is one of the most tragic of abdominal catastrophes. There is usually an extremely sudden onset, with agonizing pain, collapse and early death. From the time when it was first described by Fitz, recognition has been given to its frequent association with gallbladder disease. Much experimental work has been done in the way of injecting bile, duodenal contents and other substances into the duct of Wirsung, which frequently produces the disease. Briefly, it is now considered to be due to a sudden necrosis of the pancreatic substance, resulting from autodigestion. It occurs in its fulminant form at the height of digestion, after a full meal, when the gland is charged with trypsinogen.

Polya demonstrated that typical pancreatic necrosis with hemorrhage, fat necrosis and death was produced by the injection into the pancreatic duct of trypsin solution, duodenal contents and less constantly of bile and intestinal bacteria. Gulgke by experiments on animals was able to accurately reproduce the disease, and demonstrated that the severity of the condition depended entirely upon the stage of digestion. When the animal was hungry, the resulting disease was mild, but after a full meal, when the gland was charged with trypsinogen, the disease was very severe.

Factors influencing this self-digestion are given by Schmieden as follows: (1) By the spread of infectious duodenal contents into the pancreas through the duct of Wirsung or the duct of Santorini, (2) by the entrance of bile or bacteria into the pancreas through the common duct, (3) through arterial emboli, (4) through retrograde venous transportation, (5) through traumatic insult, (6) through infection from a duodenal ulcer, and (7) through a duodenal diverticulum. In 66.8 per cent of the cases reviewed by him, disease of the biliary tract was present and he warns against operative trauma to the gland.

PATHOLOGY

In the very acute cases coming to operation, on opening the abdomen there is usually some peritoneal injection, but not the degree seen in perforation. Rather characteristic is a collection of brownish fluid, described as resembling mutton broth. This may be fairly clear, but is usually blood-stained. In one of my cases the abdominal cavity contained a very large amount of liquid and clotted blood. Seldom is fibrin seen, but from intense irritation there is often in the mesentery or retroperitoneally great edematous blebs. Fat necrosis is the characteristic finding and in many cases first reveals the nature of the trouble. These small, yellowish white plaques may be found in the preperitoneal fat and after opening the abdomen are usually seen through the peritoneum, on the abdominal wall, in the omentum or mesentery. Overlying the pancreas, the transverse colon and its mesentery show injection and edema. The pancreas is usually enlarged, often irregularly, and presents a marbled appearance with areas of hemorrhage contrasting with the normal tissue. In advanced cases it may present a large black necrotic mass.

SYMPTOMS

Onset is sudden, usually after a full meal, with terrific pain in the epigastrium, going through to the back. The pain is so intense and persistent that it is difficult to eliict a history, and morphine does not abolish it. Vomiting is usual and in one case reported here there was repeated and profuse hematemesis. The patient rapidly passes into a condition of extreme shock, with marked pallor, rapid, weak pulse and cold extremities. Moynihan considers a condition described first by Helsland to be characteristic. "The face is lurid, and patches of a slate blue color may be distributed irregularly over the surface of the abdomen and limbs."

The abdomen may be rigid but there is not the board-like rigidity of perforation. There is usually general tenderness and this may be most marked in the upper abdomen. Death may occur early from extreme shock or the patient may remain very ill, with vomiting, slight jaundice, moderate fever, sepsis and exhaustion, usually dying in five or six days. Diagnosis is considered difficult, due to the extremely rapid course, the difficulty in getting a history, and because the condition is not frequently seen. In retrospect, we usually feel that a correct diagnosis should have been made.

TREATMENT

Less severe forms of the disease recover without operation, but when the condition is suspected, early operation should be performed to give drainage and limit the extension of the necrosis. Moynihan's surgical recommendations are as follows: "(a) In the opening of the abdomen by a paramedian incision above the umbilicus; (b) the gaining of access to the pancreas sometimes above the stomach, through the gastrohepatic omentum, sometimes below the greater curvature through the gastrocolic omentum, sometimes, though rarely, through the transverse mesocolon, after the omentum has been turned upwards; (c) the isolation of the pancreas by gauze packing covered by mackintoshes; (d) the evacuation of any fluid around the pancreas, by aspiration if the quantity is large; (e) incision of the capsule of the pancreas, to allow the escape of blood, of fluid, or of sloughs already detached from the pancreas, or resulting from necrosis of large areas of fat; (f) adequate drainage through the anterior abdominal wall, a drainage tube being surrounded by gauze, so as to create a barrier of lymph around the areas as speedily as possible; (g) posterior drainage when necessary; (h) cholecystotomy (rarely cholecystectomy) if stones are present, or the gallbladder appears diseased; if there is any doubt, drainage should be instituted."

In five of the cases here reported the gland was exposed, the capsule excised, the finger was forced through the necrotic and hemorrhagic areas. A cofferdam drain was used and then a cholecystotomy done, removing the gallstones, and draining the gallbladder.

PROGNOSIS

Fulminant cases may die in two or three days from shock. Others develop septic symptoms and die in six or seven days. Davis reports statistics from fourteen different clinics (including his own). Mortality without operation in two were 25 per cent and 33 per cent respectively. In most of the others the mortality was 100 per cent. With operation the mortality varied from 30 to 89 per cent.

CASE REPORTS

Case 1. *Acute pancreatic necrosis, cholelithiasis.* operation and recovery. Miss B., female, white, age 46. Gave a history of digestive disturbance for twenty years. During the night before admission to the hospital, she developed an intense abdominal pain radiating to the back, repeated vomiting and prostration.

Examination revealed an extremely sick woman, with marked pallor, rapid pulse, who, notwithstanding two doses of morphine, was complaining of a steady pain in the abdomen. There was marked rigidity and general abdominal tenderness. A diagnosis of perforated ulcer was made.

Operation revealed areas of fat necrosis, free blood-stained fluid, and a swollen, edematous pancreas, which was mottled with hemorrhagic infiltration. A large gallbladder was distended with gallstones. The pancreas was split and drained, the gallstones removed, and the gallbladder drained. She recovered and over a period of years has remained well, with occasional digestive upsets.

Case 2. *Acute pancreatic necrosis, cholelithiasis,* operation and recovery. Mrs. T. B., white, female, age 30. Entered hospital October, 1926. Past history negative. No gastrointestinal symptoms until four days before, when after a rather large meal, had severe epigastric pain running through to the back and right shoulder,′ accompanied by nausea and vomiting. This lasted about two hours; following that there was some heartburn, belching and distress for several days. On the evening before admission she had a very sudden attack of intense pain in the epigastrium to the left of the midline, radiating to the back.

A physician was called who gave a quarter grain of morphine at 10 p.m. and again at 4 a.m., without much relief. I saw her shortly after. Patient was a small, thin woman, extremely pale, pupils dilated, and in agonizing pain, unable to lie down, and in constant motion, vomiting at intervals. Skin was cold and pallid. Temperature 97°. Pulse rapid and weak. There was marked tenderness and resistance in the uppper abdomen on the left side. The abdominal muscles were not rigid as in peritonitis. Urine gave a test for bile and a trace of blood. Leucocytes 14,900, 90 per cent polys. A diagnosis of acute hemorrhagic pancreatitis was made.

Operation revealed the typical findings of this condition. The peritoneum was reddened and about six ounces of brownish fluid was present in the cavity.

Areas of fat necrosis were present in the omentum and on the gastrocolic omentum. The pancreas was large, the head containing a dark red area. The gallbladder was thickened and distended, containing a number of stones, with one fixed in the neck. There was evidence of hepatitis and local peritonitis. The pancreatic capsule was split and the finger, forced into the substance of the swollen head. This was drained by a cofferdam. The gallstones were removed and the gallbladder drained. After several stormy days the patient recovered. For several months following she complained of much distress and belching after meals.

Case 3. *Cholelithiasis, cholecystectomy,* recovery. Pancreatic necrosis, jejunal fistula, recovery. D. B., age 46. A rather fat, flabby, sallow man was operated on May 3, 1921, for gallstones. Gallbladder was buried by old adhesions to liver. It was thickwalled, and contained black bile and five marble-sized stones. There was marked local hepatitis and peritoneal adhesions. A cholecystectomy was done. That evening his condition was good.

Early the following morning, there was an acute attack of abdominal pain, vomiting, anu extreme collapse; pulse 164, respiration 40; cold, clammy skin, dilated pupils and slight icterus. A diagnosis of hemorrhage was made and after a transfusion, the abdomen was opened. The abdominal cavity was clean, and contained no blood, but some brownish clear fluid was present. It was observed that the gastrohepatic omentum bulged and was edematous, and then small areas of fat necrosis were seen. The pancreas, on exposure through the gastrocolic omentum, was swollen and for the most part black from contained blood. The capsule was split and a finger forced through the hemorrhagic area, and freely drained.

The patient remained in grave collapse and was kept going by repeated transfusions and infusions of glucose and saline solution. There was a large amount of thin, irritating discharge and on the eighth day after a vomiting spell, the upper part of the wound separated and several loops of small intestine protruded. With novocaine block this was repaired, although this and other procedures, such as intravenous injections, produced cold sweats, dilated pupils and at times unconsciousness. During one such spell, he had a unilateral convulsion of the face and arm.

Several days later the wound again partially opened and a free discharge of intestinal contents poured out from a large opening in the upper jejunum. From that time he ate well but all food and an enormous amount of extremely irritating intestinal juice passed out from the fistula. This resulted in a rapid loss of ground and a large area of skin erosion. On July 13 an attempt was made to close the fistula. It was located three feet from the beginning of the jejunum. As the patient went bad it was not dissected out but an enteroanostomosis was made, sidetracking it and cutting off the loop between the anastomosis and the fistula. The patient now gained weight and the discharge became very much less as the intestinal contents for the most part passed through the enteroanastomosis. After several months he became well and strong and though still having a double-barrelled fistula with a small amount of discharge, he attended to his business for three years. Then in July, 1924, under local anesthesia the fistula was dissected out and the abdomen closed, with subsequent recovery.

Case 4. *Abdominal injury, acute hemorrhagic pancreatitis,* gallstones. Subsequent pancreatic cyst, with recovery. R. R., age 33, truck driver, entered the hospital June 30, 1926. A large, powerful man. Had been well except for attacks of gallstone colic at three to four month intervals since nineteen years of age. On the day before admission, while unloading a large block of ice from truck, he lost his hold and the ice fell, striking him across the upper abdomen. He became very sick and faint and was taken home. Severe abdominal pain developed and he vomited repeatedly.

A doctor was called and three hypodermics of morhpine were given without relief. In the early morning he was admitted to the hospital. As I entered the room, he vomited a basin full of black liquid and clotted blood. Pancreatitis was considered in the case but the large hematamesis dissuaded us from that diagnosis. Patient was in collapse, with cold, pale, wet skin, rapid pulse, great pain, and frequent vomiting or retching. Abdomen was rigid and tender and signs of free fluid could be demonstrated in the flanks.

On opening the abdomen a large amount of liquid blood gushed out and the abdominal cavity was full of liquid and clotted blood. Almost immediately spots of fat necrosis were seen on the omentum, mesentery and abdominal wall. The gallbladder was distended with gallstones of various size. The stomach was small and normal. Peritoneum injected. An opening was made in the gastrocolic omentum and a swollen, black pancreas disclosed. The greater part of the head and body was tensely filled with fresh blood. The pancreas was incised, clots evacuated and drained. The gallbladder was opened, stones removed and drained.

The patient gradually recovered and left the hospital July 21. A month later he appeared in good general health, but presented a large cystic swelling in the upper abdomen. A diagnosis of pancreatic cyst was made and operation performed on August 28.

Operation revealed a large cystic swelling, over which the stomach was tensely stretched. An opening was made through the gastrocolic omentum, the cyst sutured to the abdominal wall and opened. By suction two quarts of thick, dark, cloudy fluid was removed and the cyst swabbed out. This started a rather free hemorrhage and, therefore, it was packed with gauze. In five weeks, drainage had ceased, the wound closed, and the patient has remained well.

Case 5. *Acute hemorrhagic pancreatitis, chronic cholecystitis.* Operation with recovery. Mrs. McK. Seen in consultation with Dr. E. S. Reedy September, 1922. A large, obese woman, who had had much abdominal distress, sour stomach over a period of years. On the evening before admission, while in a picture show, she was taken with a very severe abdominal pain. She was taken home and Dr. Reedy called, who gave a quarter grain of morphine.

Examination the following morning showed a very large woman, complaining constantly of intense pain in the epigastrium through to the back, with nausea and vomiting. There was marked collapse with moderate abdominal rigidity and tenderness. A diagnosis of perforated ulcer was made.

Operation revealed considerable peritoneal reaction with numerous areas of fat necrosis. There was considerable free brown fluid. The gallbladder was large with thick, opaque walls and marked local hepatitis. The pancreas on exposure was large, mahogany brown in color and surrounded by considerable edema. The capsule of the pancreas was split and the substance opened up and drained. After a serious fight, the patient recovered.

Case 6. *Cholecystitis and cholclithiasis.* Cholecystectomy with subsequent acute pancreatitis followed by pancreatic cyst. E. W. O., age 41, male, white. Tall, pale, thin, dyspeptic looking man who had been operated on October, 1926, for gallstones and chronic appendicitis. A large cystic gallbladder was found with a single nutmeg stone in the cystic duct. Cholecystectomy and appendectomy were done. Patient recovered without complications. Discharged on October 20.

About five or six weeks after operation, he was suddenly seized with a very severe attack of abdominal pain, vomiting and prostration. His family physician, Dr. Ballard, was called and considered him to be very seriously ill. He slowly improved, but was confined to bed for about four weeks.

I saw him soon after this. He then complained of marked weakness, some distress after meals, and a sense of pressure and swelling in the abdomen. Examination showed a cystic swelling about the size of a small grapefruit, a little to the left of the midline of the upper abdomen. It was fixed and slightly tender. Radiographic study led to the diagnosis of pancreatic cyst.

As he objected to operation he was kept under observation and slowly improved. Since that time he has regained his health and has worked steadily until October, 1927, when he had a rather sudden attack of faintness, following which he passed a large quantity of blood from the bowels. Study at this time showed no gastrointestinal lesion. He soon recovered and has been well since. Examination shows that he still has a pancreatic cyst which, however, has diminished very considerably in size.

JAUNDICE

ITS SURGICAL IMPORTANCE

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In a variety of diseases jaundice may be the one conspicuous symptom, and in order to carry out intelligent treatment it is desirable to determine the underlying pathology in relation to its cause. Frequently this is difficult or impossible, but it is important broadly to classify icteric conditions into surgical and nonsurgical. That this should be done early is one of the outstanding facts connected with surgery in the jaundiced patient. Destruction of liver cells is rapid where there is obstruction to the extrabiliary apparatus, and it is generally assumed that the margin of safety is greatly lessened, if definite jaundice has been present for more than two weeks on account of parenchymal cell destruction, toxic absorption, dehydration and malnutrition.

While attempting to place the patients in the surgical and nonsurgical groups, it is advisable to follow a definite plan of investigation, while at the same time improving the patient's condition should surgery become necessary. For simplicity it may be said that extrahepatic mechanical obstruction is overwhelmingly the indication for surgery and, as a great many conditions, such as hemolytic jaundice, can be quickly excluded from this category, the infectious or catarrhal type remains as the one most difficult to differentiate.

A method of investigation would include (1) the detection of bile in the duodenum by siphonage, (2) the icterus-index of the blood and (3) the van den Bergh reaction. The relative merit of these different tests is now reasonably well established and together their value is frequently conclusive.

Clinically, the presence or absence of pain is of the greatest importance. When present and spasmodic in character, a calculus is usually diagnosed. Where a calculus exists without pain, the jaundice is mild with decided variations in the serum-pigment curve. Painless jaundice, however, is almost invariably due either to pressure on the common duct by an extrinsic tumor or to intrahepatic disease. The tumor, as we know, is a carcinoma of the pancreas in the great majority of cases.

To differentiate tumor from infection, the presence or absence of bile in the duodenum as determined by siphonage is most important. The tumor produces complete occlusion of the duct, while with infection bile is present. If, however, surgical exploration hinges on this one sign, the test should be repeated on three successive days.

While the serious operative danger in the presence of jaundice is that of hemorrhage, the routine use of calcium chloride intravenously has diminished it greatly. Where this is not effective in reducing the coagulation time, as also where a purpuric condition is noted, blood transfusion should be employed. Of the greatest value in preoperative preparation also is the intravenous administration of glucose. It is specific in neutralizing toxic effects, while at the same time it combats dehydration and effects of poor nutrition.

CASE REPORT

Mrs. E. D. complained of "stomach trouble" for over twenty years. The symptoms were characteristic of gallbladder disease. Jaundice was noticed about four weeks ago and has been increasing in depth but very gradually. Epigastric pain has been continuous and of moderate severity during this time, while nausea with occasional vomiting has been a feature of her distress.

Physical examination did not give much information, no mass or other abdominal irregularity being discovered and no tenderness being present over the gallbladder. Bile was obtained from the duodenum in small quantity by siphonage and the van den Bergh reaction was positive. The serum-pigment curve was moderately high, while x-ray examination showed the shadows of calculi in the gallbladder.

After four days preparation, exploration was carried out under local anesthesia. A greatly thickened gallbladder containing stones was removed, but calculi were not discovered in the hepatic or common ducts. It was doubtful if there was any enlargement of the head of the pancreas. The liver showed evidences of hepatitis around the gallbladder region.

For four weeks after operation the patient continued to be nauseated and to lose weight. The jaundice increased but slightly but she was relieved of her epigastric disease.

Postmortem examination showed extensive cholangeitis and a carcinoma of the head of the pancreas, producing partial obstruction of the common duct.

The features of this case were (1) the toxic symptoms due to cholangeitis resulting from gallbladder infection and common duct obstruction, (2) presence of a carcinoma in the pancreas not palpable at operation and not large enough to cause complete obstruction of the common duct.

BLOOD TRANSFUSION

A FEW PERTINENT OBSERVATIONS *

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An experience dealing with five hundred twenty-six transfusion operations over a period of eighteen years has served to bring out vividly certain high lights upon which I will briefly touch. The first general deduction is the fact that during this time it has become an established and at times a life saving procedure and something more than an early English writer facetiously states it, "a sort-o'-will-o'-the-wisp of science, holding out the most brilliant prospects which never seem to be realized."

Certain steps have led up to the present day method of transfusion: (a) 1907, Jansky grouping, (b) Crile's canula the same year, (c) 1913, Lindemann syringe canula method, (d) 1915, Lewisohn citrate giving further impetus toward simplicity of the operation.

For the sake of clarity may I call to your attention the five obvious physiologic effects accomplished by transfusion, namely, (1) Restoration of bulk of circulating fluid, (2) provision of oxygen carriers and assimilable food to tissues, (3) increase in coagulability elements, (4) stimulus to blood-making organs, (5) increased resistance to infection by its bactericidal and antitoxic properties.

In this group one or more of these effects has been operative. The indications range from pellagra, pernicious anemia, the purpuras, hemophilia, hemorrhage neonatorum, surgical shock, debilitated states preliminary to operation, acidosis, anemia secondary to hemorrhage, burns, carbon monoxide, benzol and bichloride poisoning, to sepsis with blood stream infection following mastoiditis with sinus thrombosis the last case.

Hemorrhagic anemia is the indication par excellence. We find in the list hemorrhage from every part of the body, as uncontrollable bleeding in the eye, nose, teeth sockets and gums, stomach, duodenum, ileum, rectum, crushing injuries to extremities, pelvis and skin and joints.

A word with regard to sepsis. Judging from certain very good results I believe that transfusion is deserving a more extensive consideration. Here necessarily the whole treatment hinges upon our ability to increase the individual's resistance sufficiently to make the fight. One of the best agencies at hand, I have found, is repeated transfusions of 300 c.c. to 400 c.c. at about three day intervals.

One was a case of septicemia following abortion, going on to complete recovery after the third transfusion so ordered. Two other cases stand out clearly, one a double mastoid with blood stream infection running septic temperature for two weeks, responding to a single 500 c.c. transfusion, temperature dropping to normal the day following and continuing. A second case with hand and arm infection with exsanguinating secondary hemorrhage, yielding to a 1000 c.c. transfusion, the sloughing granulation tissue fairly sprouting under the stimulative and curative action of the new blood. In burns exsanguinaton-transfusion reduces toxemia and here again the curative effect is noted in the healing processes in the skin.

The amount ranges from small repeated transfusions of 300 c.c. at three day intervals to a single massive transfusion of 2000 c.c., the average amount being 500 c.c. The effect of 500 c.c. is graphically illustrated by Feinblatt, taking the hypothetical case of a woman weighing 130 pounds. Under normal conditions her blood volume would probably occupy about five liters. Assuming that, as a result of a blood dyscrasia, her blood volume is reduced to 75 per cent and the red count to 40 per cent of the normal. In that case her oxygen carrying capacity, so far as the red cells are concerned, would be reduced to 30 per cent of the normal ($0.75 \times 0.40 = 0.30$). Under such conditions, the addition of 500 c.c. of blood from a healthy donor would constitute an increment of oxygen carriers, approximately equivalent to one-third of the number already possessed by the recipient.

With regard to the number of transfusions in a single case, there is one in this list of pernicious anemia who was given his twenty-third and twenty-fourth transfusion to keep him alive over a period of three years.

Two instances will suffice to stress the importance of proper selection and matching of donor and recipient. Simple denial of syphilis on the part of

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* Read before King County Medical Society, Seattle, Wash., Nov. 7, 1927.

a donor is not without danger, as one recipient following transfusion developed a rash with four plus Wassermann, the donor later being tested and found positive.

A second case exhibits the value of cross matching. It is not always safe to use a so-called universal donor (group I Jansky). In this case, a group II recipient, the donor's cells were not agglutinated but recipient's cells were agglutinated by donor's serum. Transfusion was discontinued at the end of 60 c.c., marked premonitory symptoms being shown at the end of the first syringeful, 20 c.c. Recipient manifested severe dyspnea, flushed face, sweating about the head and air hunger. Dyspnea continued till three days later, when patient died. Incidentally the autopsy revealed advanced carcinoma of the stomach and terminal peritonitis.

The converse of the preceding case served to determine finally the method I now use. A case of pernicious anemia was given very expeditiously a 500 c.c. transfusion of citrated blood, dying forty-eight hours later in coma from a definite hemolytic jaundice, and that notwithstanding perfect matching by cross agglutination both ways preliminary to and rechecking following the procedure. The citrate may have had something to do with it. Why use it, when we have a simple, quick, and flexible whole blood method, such as the Lindermann canula syringe method which answers all objections and gives perfect satisfaction. This method I have used without a hitch in the last 226 operations.

CONCLUSIONS

1. I would stress the importance of properly selecting and cross agglutinating donor with recipient.
2. While hemorrhage is the chief indication, do not overlook the value of transfusion in sepsis.
3. Whole blood is physiologic and without danger per se.

COMBINED VENTRICULAR AND LUMBAR PUNCTURE IN DIAGNOSIS OF BRAIN TUMOR. Combined ventricular and lumbar puncture was performed by John S. Hodgson, Boston (*Journal A. M. A.*, May 12, 1928), in forty-nine instances. This method makes it possible to obtain lumbar fluid in all cases, including those showing high-grade papilledema with less danger of medullary injury than with lumbar puncture alone. In patients with subtentorial lesions, a certain degree of dynamic block between ventricles and lumbar subarachnoid space was found in two-thirds of the cases, and absence of block in one-third of the cases. This represents an increase in the latter type since the author's original communication in 1924. In patients with supratentorial lesions, block has been absent except in a case of pinealoma. In subtentorial lesions, the ventricular protein value is normal, while lumbar protein value was found increased in two-thirds of cases and within normal limits in one-third.

EPILEPSY AND ALLIED CONDITIONS

MECHANICAL FACTORS IN THEIR ETIOLOGY *

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In the discussion of the subject of idiopathic epilepsy one is reluctant to offer a new theory concerning the etiology. However, a study extending over a period of four years, during which time more than 152 cases have been carefully analyzed, has convinced us that there are certain mechanical and individual factors having a distinct bearing upon the development of periodic convulsive seizures, symptomatic of disordered function of the brain. The statement that the theories of the past are inadequate and have failed to explain the different types of epilepsies is not necessarily proof that these theories are wrong. Probably each theory is based upon sound reasoning, but mechanically, chemically and physiologically the convulsive seizure, regardless of the type of epilepsy, is fundamentally the same.

First, let us consider the theory of toxemia as the cause of the periodic convulsive seizure. If this supposition is correct, a toxemia which will cause convulsive seizures in one case should cause them in all. Reasoning thus, all pregnant women should develop eclampsia. This may be carrying the argument to the *n*th degree, yet fundamentally it is true. The same argument should apply in the traumatic theory. All craniocerebral injuries should sooner or later produce convulsive seizures. We know this does not occur. Here and there a case of pregnancy, a traumatic brain condition, an alcoholic or a growing child suddenly develops periodic convulsive seizures and we diagnose the case as eclampsia, traumatic epilepsy, alcoholic convulsions or idiopathic epilepsy, as the case may be.

Is there a factor common to all of these individuals which, in the presence of any of the above exciting causes, will always produce a seizure in that particular individual? In other words, is there such a thing as a potential epileptic, requiring only an exciting cause to touch off the convulsive seizure? In the past remedial measures have been directed toward the control of the seizures and thus theoretically the establishment of a cure through symptomatic treatment. Operations upon the cerebral cortex, the colon, the uterus, the thyroid, adrenals and other organs have from time to time been advocated in an effort to attain this end.

Perhaps in the past we have approached the

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* Read before a Meeting of North Pacific Pediatric Society, Seattle, Wash., Jan. 28, 1928.

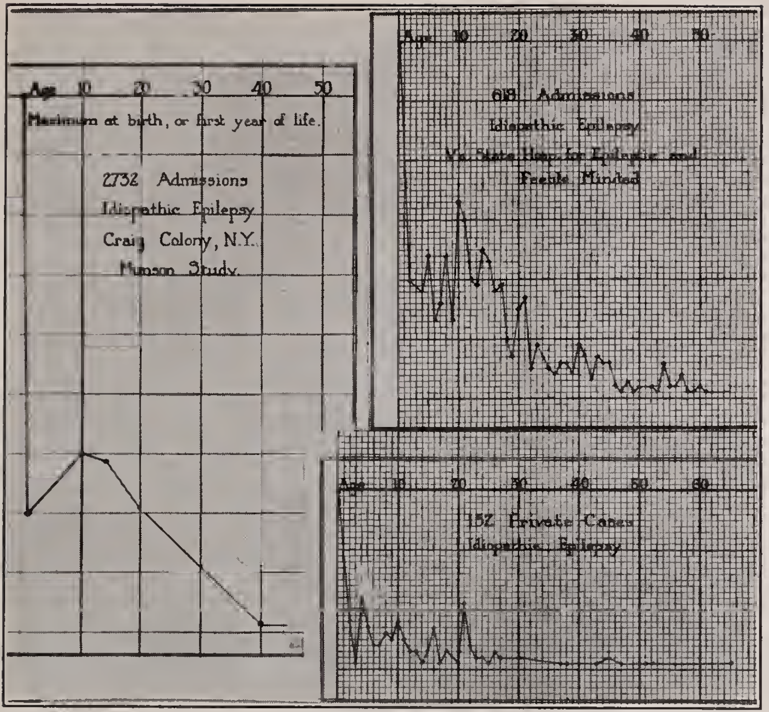

Fig. 1. Graphic chart showing year of onset of seizures, with peaks at first, fourth, seventh and tenth years of life; at puberty and pregnancies, represented at fourteenth and twentieth years.

subject from the wrong angle. Hypothetically speaking, it is possible that nature utilizes the convulsive seizure as an emergency measure in defense of the brain. Is it not possible that there is a structural defect in the development of the cranial cavity and dural sinus circulation in certain individuals, which under the ordinary conditions of life does not interfere with cerebral function, but which under certain conditions will bring about a situation incompatible with the normal function of the brain? In these particular individuals nature may utilize the convulsive seizure in an effort to reestablish the normal.

If this is true, then there must be certain individuals (potential epileptics) who will, at critical periods in their lives, be susceptible to this imbalance and its resultant convulsive seizure. Such a person probably will develop seizures at these periods, depending entirely upon the degree of the developmental cranial defect, (1) at the time of ossification of the cranial bones, (2) at puberty, (3) during pregnancy or menopause, (4) due to toxemia from any cause, chronic alcoholism, and traumatic lesions at any age, (5) arteriosclerosis (senile) or degenerative changes. A series of cases from hospitals and clinics showing the age of onset seemingly corroborates this theory (fig. 1).

THE STRUCTURAL DEVELOPMENT OF THE SKULL. VARIABLE FACTORS

The cranial cavity can be considered as a closed compartment, encasing the brain, the meninges, the blood vessels and the blood. As such, it is, according to the Monroe-Kellie doctrine, subject to certain physical laws regarding the inflow and outflow of fluids. A decrease in size of the solids must be compensated for by an increase in the amount of fluids. The velocity of the blood flow, rather than the size or caliber of the vessels, governs the intracranial circulation of the blood. Therefore, the arteries and veins may be disregarded as a variable factor in our consideration of this problem, except in their relation to another factor, namely, the cerebrospinal fluid. This will be considered later. Surely we cannot attach any importance to the blood vessels from the developmental viewpoint.

THE CEREBROSPINAL FLUID

The brain itself is a sponge-like structure, capable of absorbing enormous quantities of water. Its size varies both with the normal circulation and other changes of body conditions, toxemias, febrile conditions, wasting illnesses, anemia, etc. Nature has provided the ingenious "split-off" of the cerebrospinal fluid from the blood to form an independent circulation of fluid, which acts as a compensatory substance to fill the spaces when the brain shrinks and to flow out, thereby making room for the brain as it enlarges. Large reservoirs are used to care for this changing quantity of fluid. Thus does nature protect and probably cleanse the brain and meninges and hold in reserve sufficient cerebrospinal fluid for emergency use. Cushing's presentation of the "third circulation" gives a complete picture of this most interesting physiologic process.[1]

For our purposes we must consider the cerebrospinal fluid as one of the important factors in this discussion. The brain, because of its constant bulk and functional variation under different physiologic conditions, must be considered from its functional rather than its physical aspect. It lends itself so easily to changes in size that it must have sufficient room for these changes in bulk, otherwise it cannot function. Therefore, under no circumstances can we consider the brain as a causative factor, but any changes in its physical appearance noted in epileptics, such as atrophy of the cortex, dilatation of the ventricles, etc., are the end-result rather than the cause.

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[1] Cushing, H.: Studies in Intracranial Physiology and Surgery.

THE SKULL AND ITS DEVELOPMENT

This leaves only the bony structure itself and the membranes to be considered with the cerebrospinal fluid. Is there any constant developmental defect in the skull of the epileptic?

One of the first observers to detect certain abnormal or bony anomalies of the occipital bone in epileptics was Zinenski. In 1921 he reported in the *Gaz. lek.*, pages 56-141[2], observations made during postmortems on individuals who had suffered from idiopathetic epilepsy. In his necropsies he frequently encountered deviations from the normal in the occipital bone. In some of these bodies it was found that the clivus formed a right angle with the spinal column. In consequence of this, the pons and the bulb occupied an abnormal position in relation to the spinal cord, and the flow of cerebrospinal fluid. from the aqueduct of Sylvius and the fourth ventricle was retarded.

Some other observations bearing upon these interesting aspects of convulsive seizures have been recorded by Anton.[3] He found that by means of craniograms, taken with the head in the proper position, the size of the posterior fossa can be fairly well estimated. In some of his cases he has observed that there is a fusion of the atlas and occiput and that this is a very common condition. He believes that compression symptoms rarely occur but that such individuals are very prone to develop convulsive seizures. He is of the opinion that in most cases the synistosis is a developmental disorder.

THE POSTERIOR FOSSA

What function does the occipital bone have in the structure of the cranium? It forms the floor of the posterior fossa and is the variable factor in governing the size and capacity of this fossa. The body of the sphenoid and the pars basilaris of the occipital bone to the anterior margin of the foramen magnum forms the anterior wall. The mastoid portions of the temporal bone forms the anterior lateral wall. The tentorium forms the roof, while the occipital bone, from the superior curved line down to the posterior margin of the foramen magnum, forms the floor.

If, for any reason, the occipital bone does not develop to its normal size or is deformed, there will necessarily be a smaller posterior fossa, in which must be lodged the cerebellum, brain stem, fourth ventricle, lateral and sigmoid sinuses. Assuming that these structures grow to normal proportions, something within this smaller posterior fossa must be displaced as growth takes place.

THE VENOUS SINUSES

First of all, we have the accommodating cerebrospinal fluid filling the cisterns and interspaces about the base, communicating freely and easily through the incisura with the cisterns and the cerebral fossa. Second, we have the sigmoid portion of the lateral sinus, the inferior petrosal sinus and the occipital sinuses. These sinuses differ from all other venous sinuses within the cranium in that they are formed by a splitting of the dura, so as to form round or elliptical rather than triangular channels or cross-section, such as the longitudinal, transverse and superior petrosal sinuses.

The shape of these channels or sinuses is of as great importance as their location because it renders them subject to changes in caliber under varying degrees of pressure. This is not true of those sinuses which are triangular in shape and formed by the junction of the falx cerebri, tentorium and the meninges. The cross-sectional shape of these sinuses is also of vital importance because a decrease in the size of the lumen of the sigmoid sinus means a slowing up of the venous outflow from within the cranium. The blood from the entire cranial cavity must eventually pass through the sigmoid sinus, except the small amount which escapes through the sphenopalatine, occipital sinuses and the facial vein (fig. 2).

In most animals there is a free communication between the anterior extracranial vessels and the anterior intracranial venous channels, but in man this is poorly developed. It has been found that in some animals the basilar venous channels are partially or wholly covered with bone, evidently for protection against pressure. These two anatomic factors may account for the fact that essential epilepsy (periodic convulsive seizures) in the lower animals is rare indeed. Convulsions do occur in birds and mammalia but toxins, infections, etc., are the usual etiology.

The sigmoid sinuses not only carry the venous blood but with it the cerebrospinal fluid. Pressure,

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[2] Abstracted in Practical Medicine Series, Nervous and Mental Diseases, 1922.

[3] Zentralbl. f. d. ges. Neurol. u. Psychiatr., Sept. 15, 1925.

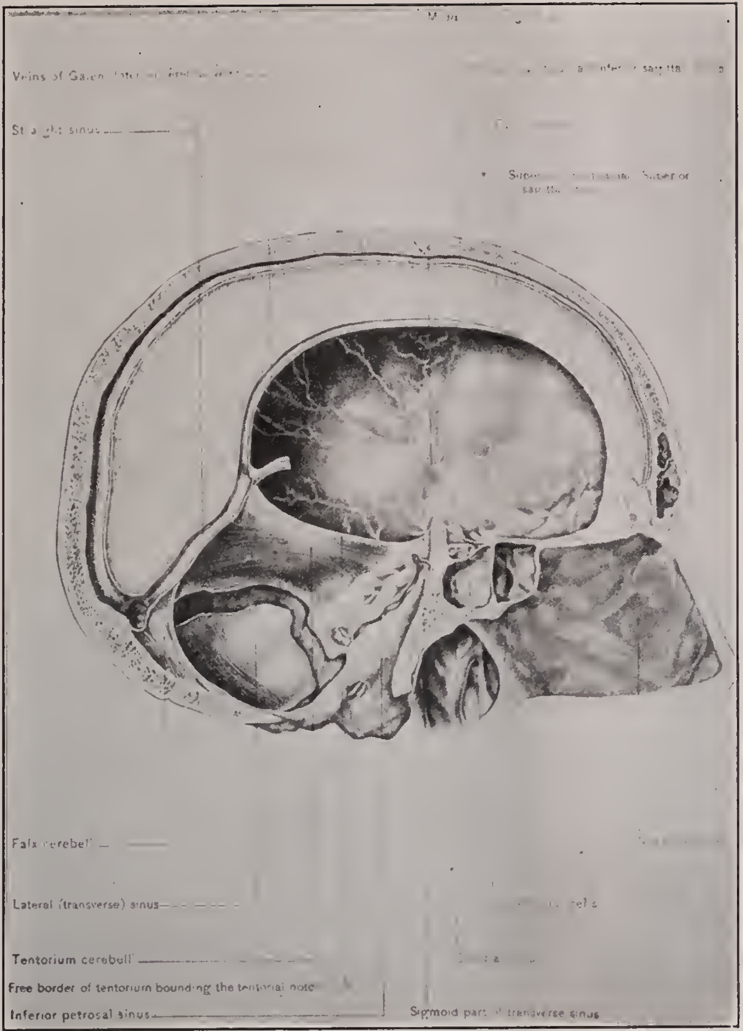
Veins of Galen
Straight sinus
Falx cerebelli
Lateral (transverse) sinus
Tentorium cerebelli
Free border of tentorium bounding the tentorial notch
Inferior petrosal sinus
Sigmoid part of transverse sinus

Fig. 2. (From Deaver's Anatomy.) Shows how the sigmoid sinus drops downward and inward from the tentorium cerebelli and courses along the mastoid and occipital wall of the posterior fossa.

causing a decrease in the easy circulation within the sigmoids, therefore, must interfere with the reabsorption of the cerebrospinal fluid higher up in the superior longitudinal sinus (fig. 2) and must cause an accumulation of cerebrospinal fluid outside of this sinus. It has been demonstrated that there is a lower pressure (5-50 mm. less) in the dural sinuses than cerebrospinal fluid pressure. Investigators have claimed that this is the secret of the force transmission (dialysis) of cerebrospinal fluid through the arachnoidal villi into the longitudinal sinus. Increasing this intrasinus pressure would explain the decreased absorption with lake formation of cerebrospinal fluid in the cerebral subarachnoid spaces and the ventricles in these cases.

THE THRESHOLD

The occipital bone, if it is underdeveloped, brings about a disturbance of the normal ratio of the size of the posterior fossa to the contents thereof and is the first variable factor, while the cerebrospinal fluid must be considered as the second. It follows, then, that there is a threshold beyond which nature will attempt to reduce or correct an excessive accumulation of cerebrospinal fluid. This in the normal individual is at such point as to permit of a considerable encroachment of the brain on the sinuses at critical periods in the life span of the individual, namely, at the time of ossification and closure of the cranial bones, at puberty, during pregnancy, in acute diseases and toxemias and, finally, in the degenerative or arteriosclerotic period of life. When this threshold is not sufficiently high to permit these variations, then these, in turn, at their different periods of life, bring about the compensatory efforts of nature, namely, the convulsive seizure.

In those individuals, in whom the threshold is still lower, even the complete bony development ushers in the convulsive seizures (7 to 10 years) and in certain individuals ossification and closure itself mark the time of onset of convulsions. From this it would follow that a microcephalic should always have periodic convulsive seizures. In our study of cases, the microcephalic children have all had convulsive seizures at some time or other. It is conceivable, however, that the brain itself may fail to develop in exactly the same proportion as the skull, in which case there would not be convulsive seizures. In hydrocephalic patients, however, it is a well known fact that seizures are common. This would substantiate rather than disprove the theory.

The convulsive seizure may be explained as a defensive mechanism rather than the effect of irritation. Its appearance is usually when the accumulation of cerebrospinal fluid, in the subarachnoid lakes over the motor or so-called epileptogenous zones, has caused sufficient pressure or fluid stasis, with resultant reaction. This may be a mechanical attempt to stimulate absorption of cerebospinal fluid and to accelerate venous drainage from the skull.

PATHOLOGY

Is there any pathology found at operation that would substantiate this theory? If one examines the brain of a child of six to twelve months of age, having true epileptic seizures, one will find that the cortex has not as yet become atrophic but is in a state of chronic passive congestion. The veins of the arachnoid, the capillaries coursing over the cortex and the capillaries in the arachnoid are all distended and tortuous, and the spaces of the arachnoid are dilated with cerebrospinal fluid under pressure and lakes have already begun to form.

When one examines the brain of the ten-year-old patient, suffering from periodic convulsive seizures, a marked change has occurred. The veins of the arachnoid are now widely dilated and tortuous and the capillaries of the cortex are increased in number over the normal. The arachnoid lakes are deepened and the arachnoid itself seems thickened with many yellowish white plaques scattered along the course of the vessels. Frequently the veins of the arachnoid communicate freely one with another (fig. 3) and stand out like whip-cords on the surface of the cortex, filling in all of the spaces between the narrow atrophic convolutions, giving the arachnoid a plum-colored appearance. In other cases a beefy-red appearance is noted, due to cortical capillary engorgement, while the veins are fewer in number and perhaps not so distended (figs. 4 and 5).

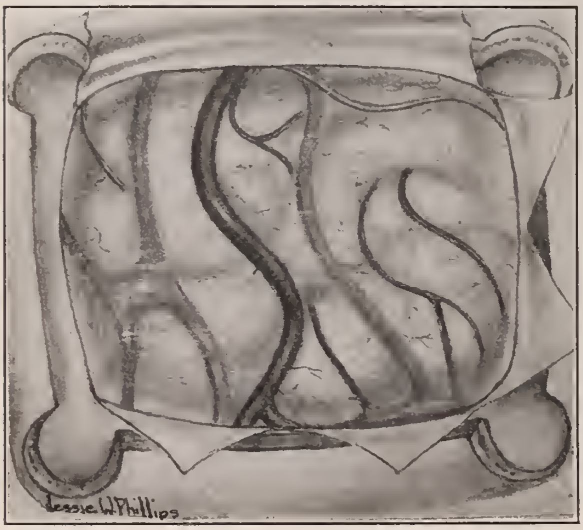

Fig. 3. Mesial picture seen in epileptics of 10 to 15 years of age. Intercommunicating veins and arteries and lake formation of subarachnoid, as described by Dandy and others. Convolutions beginning to atrophy.

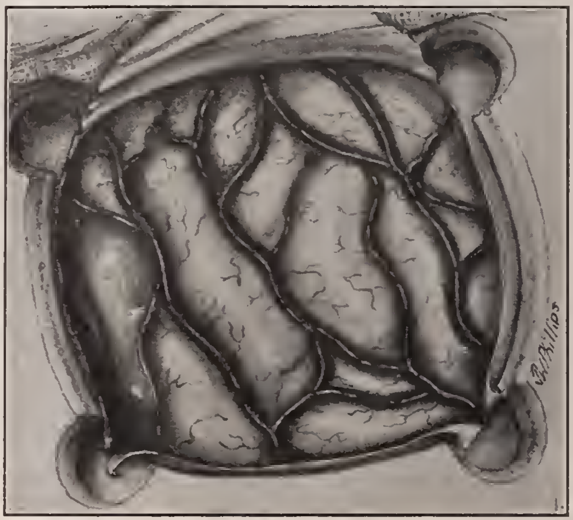

Fig. 4. Marked distention of veins of arachnoid, completely filling the spaces between convolutions and frequently coursing across the convolutions. Lake formation on left side of drawing.

The mechanical pressure causing these changes can be thus explained as the result of a little backward pressure within the sigmoid sinuses, not sufficient to cause hydrocephalus, but just enough to cause a decrease in the flow of venous blood in the sinuses. This increases the intrasinus pressure. In turn, the flow of blood in the longitudinal and straight sinuses becomes retarded, then the decreased absorption of spinal fluid and venous blood follows, both from the arachnoid spaces and vessels and from the vein of Galen and the ventricles of the brain (fig. 2). This, in turn, results in lake formation in the arachnoid, in the dilated veins of the cerebral cortex, the ventricles, and the congestion of the cortical arterial capillaries. Pressure from the cerebrospinal fluid in the subarachnoid spaces on the outside and the cerebrospinal fluid accumulation within the ventricles on the inside results in pressure atrophy of the cerebral cortex.

SYMPTOMS

Coincident with this changing pathologic picture are the changing symptoms one notices in the development of the epileptic patient. The first increase in pressure in the posterior fossa causes restlessness. It may bring about disturbed movements, sometimes pseudoathetoid in character, or purposeless throwing about of the arms and kicking of the legs, rocking movements, bumping of the head, crying out during sleep as in sudden fright or pain, followed eventually by convulsive seizures. When the onset is retarded until ossification, from the third to the fifth or seventh year, the child is backward in creeping and walking, is irritable, particular about his food, shows a tendency toward ricketic development. Optic atrophy beginning as a slight pallor of the optic nerve heads frequently accompanies this type; speech may be retarded or absent; there may be a tendency to drool, and also a peculiar gait, best described as a tip-toe or dancing gait; the child is usually clumsy and falls easily.

These symptoms frequently precede the first convulsive seizure during this period. When the threshold is higher and the first attack comes at puberty, the pathology is already developed to such a degree that permanent damage is done. We see the final picture in the so-called epileptic personality, the deteriorated patient with atrophic, shrunken convolutions, thin cerebral cortex and enormously distended ventricles.

THE RELIEF

If anything can be done to relieve these cases, it must be through a relief of the pressure against the sigmoid and lateral sinuses, thus establishing the easy outflow of venous blood and cerebrospinal fluid from the cranial cavity. This may be done either by an occipital basilar resection and decompression along the lateral sinuses, or an anterior resection in front of the sigmoids. Since the latter procedure is through the mastoids and subject to possible later infection, it is more expedient to do the more extensive, though less dangerous posterior operation. This is readily performed, is practically free from mortality, and in early cases apparently accomplishes the desired end.

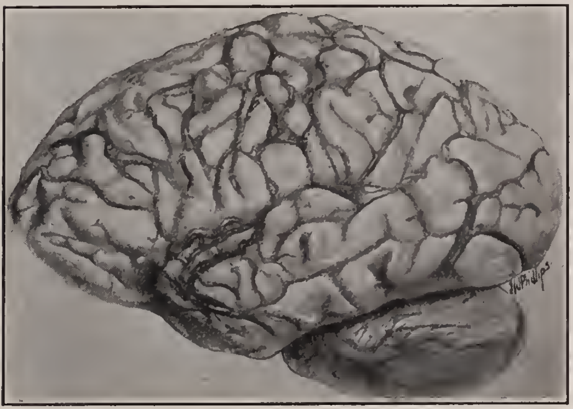

Fig. 5. Brain of child of five years. Death occurred during status epilepticus. Brain shrunken to small size. Large lakes of subarachnoid fluid along the Rolandic fissures and in the cisterns. Many newly formed vessels.

CONCLUSIONS

So-called idiopathic epilepsy and allied conditions (motor variants) may be due to mechanical factors as the result of a defect or arrestment in the development of the occipital bone. A decrease in the size, or abnormal development of the occipital bone results in a decrease in the capacity of the posterior fossa. Unless there is a corresponding decrease in the size of the brain in these individuals, something must be displaced as the brain develops. The sigmoid, inferior petrosal and occipital sinuses are the only venous sinuses within the cranial cavity which are elliptical in shape and not formed at the junction of two planes of the dura, but course downward from the margin of the mastoid to the jugular bulb at right angles to the transverse sinuses. This peculiar anatomic arrangement of the sigmoid sinuses permits of pressure against the walls of the sinuses, causing a decrease in their caliber.

Potentially, certain individuals are subject to variations in the function of the brain at critical periods of life, namely, at the time of birth, ossification of the cranial bones, puberty, pregnancy, menopause and at any time as the result of congestion of the brain due to trauma, alcohol, acute febrile conditions and, lastly, arteriosclerosis and other degenerative changes.

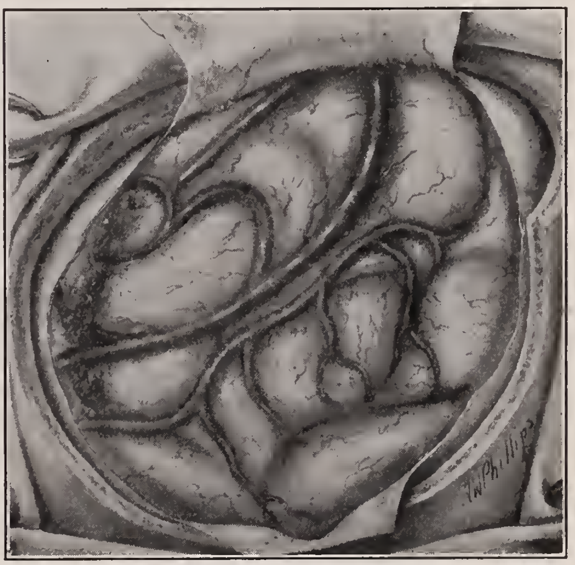

Fig. 6. Newly formed vessels in case of traumatic epilepsy, the result of gun shot wound (B. B. shot) fourteen years prior to first seizure.

The cerebrospinal fluid plays an important part in the development of increased intracranial pressure. This is due to a damming up of the venous blood in the lateral and the longitudinal sinuses, causing retardation of the easy passage of cerebrospinal fluid into these sinuses (increased intrasinus pressure). The epileptic threshold may be considered as that point in a ratio between the inflow and outflow of cerebrospinal fluid, above which the human brain cannot function and below which the normal variations in congestion of the brain are not disturbing factors.

TREATMENT OF ANTERIOR POLIOMYELITIS*

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The acute attack of anterior poliomyelitis, or more frequently designated as infantile paralysis, is so similar to a number of the febrile conditions in children that it frequently is not diagnosed until the paralysis has developed. If a child, normally active, gradually becomes listless, and then, after a few days, suddenly develops a temperature of 102° or 103°, with nausea, and vomits once or twice, complaining of more or less general muscle soreness, this condition should be considered, especially during an epidemic. At this time the treatment varies according to the individual case. In severe cases, where the respiratory center is involved, it may be necessary to apply extreme measures to save life. In the milder cases the ordinary measures used in any acute febrile condition are the best treatment.

The question always arises as to the value of the serums at this stage. I have seen cases, which have had the serum early, develop a very marked paralysis, so we can say that it does not prevent paralysis. In the mild cases I would not ordinarily use the serum, but in the extremely ill cases it is possible that it may be of some benefit. At least the parents and physician both feel that everything possible has been done.

During an epidemic, or where it is possible that others have been exposed, the question frequently arises as to what precautions may be taken. It seems there are large numbers having a natural immunity, and that the normal nasal secretions are quite resistant. If everything is done to prevent a child's general resistance from being lowered, and if the normal resistance of the nasal secretion is not lowered by antiseptics and other irritants, we are probably doing everything possible.

Following this acute attack, which usually lasts only a few days, I will divide the condition into three stages for convenience in describing the treatment. The first stage lasts from two weeks to several months, and is limited by the disappearance of muscle soreness. The second stage begins when the muscle soreness disappears, and covers a period of two years or more, while the muscle power is gradually returning. The third stage commences when the maximum improvement in muscle power has been obtained. In this class there are the cases of fixed or permanent paralysis.

During the first stage the treatment is preventive, that is, to prevent muscle fatigue and prevent contractures. These can best be accomplished by placing the paralyzed extremities in some sort of support, the most comfortable and efficient being plaster of paris casts or moulds. This relaxes and rests the paralyzed muscles, and at the same time, by preventing motion of the part, it inhibits all afferent impulses from entering the spinal cord and stimulating the diseased anterior horn cells through the reflex arc.

Contractures are caused by a loss of muscle balance, following a paralysis of a group of muscles. These are always preventable, and when found, indicate neglect on someone's part. If the paralyzed extremities are placed in casts in a favorable position early, the contractures are anticipated and easily prevented. During this stage the child should, as a rule, be kept in bed and no active treatment attempted. Diathermy and other forms of heat may be used, and give definite relief in some cases.

With the second stage, our active stimulative treatment commences, with support to the affected part as indicated in each case. Braces are used wherever protection is needed. These are sometimes worn both night and day, or may be replaced at night by some lighter splint in certain cases. These braces are not applied, as some people think, to allow the children to walk better, but simply to relieve the paralyzed muscles of all strain during weight bearing or when the patient is erect. A paralyzed muscle will not recover, if it is allowed to remain in a stretched position, and this support must be continuous for every minute of the day and night to accomplish best results.

The stimulative treatment is best accomplished by massage and muscle training. Electricity, if used at all, should be in the latter part of this stage. Lovett never allowed electricity of any sort to be used on his cases at any time, stating that the muscles are so quickly fatigued that a great deal of harm can be done. I make it a rule never to use any electricity the first year, but have had a number of cases of several years standing which have shown a definite improvement by the use of faradic and galvanic currents. This should be done by a competent technician, who is aware of the danger of overstimulation.

Muscle training consists of teaching the patient to perform certain movements which will exercise the weakened muscles individually or in groups. These should be done daily in a carefully supervised manner.

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* Read before Thurston and Mason Counties Medical Society, Shelton, Wash., April 19, 1928.

Treatment on a case at this stage usually consists of a preliminary warming up to relax the part and improve the circulation. This is done by radiant heat, whirlpool bath, plain water bath or diathermy. Next, the entire part is massaged to improve the circulation and stimulate the weakened muscles. The last part of the treatment consists of exercises, carefully watching for any sign of muscle fatigue.

In the last stage we have accomplished a maximum improvement in muscle power or, if the muscles are capable of any improvement, we do not expect it to be of sufficient degree to materially improve the function of the part. Any deformities or contractures must be corrected; weak or flail joints must be stabilized and, wherever possible, an attempt is made to rid the patient of braces.

The deformities are corrected by tenotomies, fasciotomies, osteotomies, or in some cases by simply stretching exercises or in casts.

Attempts have been made to stabilize flail joints for a number of years by tendon or ligament reefing, by silk sutures, or by Galli's methods of burying the paralyzed tendons in bone. These were all found to be unsatisfactory, due to the fact that if weight bearing is thrown on soft structures in a paralyzed extremity over a period of time, these structures will stretch and allow the extremity to go into a deformed position. So at present the stabilization is done by operative work on the bony structures, ordinarily not depending on the soft parts for any support.

These operations consist of actually arthrodesing the joint in a favorable position, or by some type of blocking operation. Occasionally it is possible to transplant the tendon of a strong muscle so that it will take up the function of a paralyzed muscle or group. This should be done only under rather ideal conditions, or failure will result. Hoke, of Atlanta, has cleverly combined the arthrodesing and tendon transplanting operations in favorable cases in such a manner as to produce almost normal function of a paralyzed extremity.

We occasionally see a paralytic case of several years standing who has been wearing braces which protect the paralyzed extremity and also enable him to get about to a degree to which he would not be able without the braces. By some operative procedure or procedures, it is possible in certain cases to enable these unfortunate individuals to discard their braces without improving the functions of the part to any appreciable extent. This is a desirable procedure for, although they become accustomed to their braces, they are always very happy to discard them and are willing to be subjected to very radical operative work to be relieved of the gloomy prospect of braces for life.

I wish to mention scoliosis under this discussion, as we feel at the present time that a large number of the cases of scoliosis develop as a result of a mild paralysis of the back muscles on one side. This is usually overlooked at the time of the acute attack, especially when the muscles of the four extremities escape, and when the paralysis is mild. When the curvature is slight and the spine is flexible, very satisfactory results are obtained by massage and corrective exercises. The ones with a marked curvature and rotation are more difficult to correct, and respond most satisfactorily to the methods now used by Steindler and others. This consists of exercises, corrective casts, stretching on a frame, and in the extreme cases fusion of the compensatory curve to hold the correction and prevent further deformity. The improvement is easily apparent and clinically the results are good.

There is hardly any class of cases where the progress seems slower, and at times more discouraging, than in these cases of so-called infantile paralysis but, if we carefully follow out what we know to be the correct procedure, we are doing everything possible, and the results on the whole will be quite satisfactory.

ARTHRITIS *

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In presenting a paper on arthritis it is quite unnecessary to state that it is a subject of huge proportions. There is no known disease of greater antiquity. Evidences of it are found in the oldest remains of the human family. Then as now it was no selector of persons, for ancient kings and queens were affected as well as vassals and underlings.

The great mass of literature in the archives of medicine gives evidence of much thought and study by the physicians and scientists over a period of a hundred or more years. Glancing back over this literature one is surprised at how little real fundamental advancement has been made in acquiring a clear conception of the disease and in perfect-

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* Read before Chelan County Medical Society, Wenatchee, Wash., April 3, 1928.

ing methods for its control and relief. Great numbers of "cures" and treatments have been exploited only to be forsaken or discarded after the test of time has been made. So it has come about that the experienced clinician is extremely skeptical about any methods proposed for the treatment of arthritis. He is from Missouri, and rightly so.

I believe that Rosenow should be given credit for laying the foundation for our present day conception of the infectious etiology of arthritis. In his work on the specificity of the streptococcus he demonstrated that certain of these organisms removed from arthritic patients, if injected into rabbits, would produce similar pathologic changes in the joints of these animals. Much experimental work has been done since that time by various workers along this line and his results have been corroborated in a general way.

Hadjopoulos, in a recent article in the *Journal of Joint and Bone Surgery,* has reported some forty cases in which organisms, mostly streptococci, have been isolated from the blood stream of arthritic patients which, when injected into rabbits, have produced arthritic changes in the joints of these animals. This tends to prove three points: first, that arthritis is infectious in origin; second, that the streptococcus is the most common offending organism, and, third, these organisms are carried by the blood stream.

Considerable data are at hand which also tend tc prove that the rational method of treating infectious arthritis is by antiseptic and serologic methods. Burbank and Hadjopoulos in New York have reported on a huge series of cases treated along these lines with encouraging results.

While I am inclined to accept the infectious theory of etiology of arthritis in a general way, I am convinced that there are several other factors which must always be considered which may have a direct or indirect bearing on many of these cases. The most important of these is endocrine disturbances. I have a number of cases, showing definite arthritic signs and symptoms, which were partially or entirely relieved by mixed thyroid and ovarian treatment. The only question in my mind is whether the symptoms were brought on by the lack ot endocrine balance or whether the added thyroid simply whipped up the body resistance to the infection present in the system.

Other systemic conditions having a bearing on arthritis are anemia, hypertension, nephritis, etc. I believe these conditions only tend to reduce body resistance or immunity through faulty elimination and metabolism. In treating arthritis, however, they are important to observe and treat if present.

So far, this discussion has had reference to arthritis in general of the painful type. I think that, before proceeding further with etiologic factors, it might be well to clarify the air as to the different types of arthritis. There is much dissension in the ranks as to classification of this disease.

I am offering a simple working classification of my own which in the main is purely clinical. There are three chief classes. First, we have the *nonproductive* which is sometimes classed as atrophic arthritis; second, is the *productive* or hypertrophic arthritis or osteoarthritis; third, is the *special* class which includes gonorrheal, tuberculous, syphilitic, rheumatic fever types, etc. Of course, we encounter many cases of mixed types but they all tend toward one of these general headings.

The nonproductive type includes Still's disease of children and the progressive polyarthritis so common in older children and young adults. It is almost always polyarthritic. Radiograms show a thinning of the joint space and later roughening of the joint surface. There is the lack of lipping of the joint edges which is found in the productive type. These cases, especially when the onset is early in life, are nearly always progressive and, if not successfully treated, eventually result in almost complete stiffening of the affected joints. I consider these cases universally infectious and progressive. They are probably due to an inherent weakness on the natural immunizing system of the body.

The productive type is the arthritis of middle or late life as a rule. It is frequently monarticular or limited polyarticular in character. The onset is more insidious with stiffness as the first sign. Later on it becomes painful, the symptoms very often following trauma, exposure or some illness. These elements are not as a rule the cause of the disease but merely act as agents to precipitate symptoms of a preexisting condition.

I consider the productive type of arthritis as two distinct processes. The first is of unknown etiology which produces the hypertrophy about the joint or joints. This is painless but may produce stiffness of various degrees. Superimpose, then, a trauma, exposure or what-not, and any latent streptococcic infection in the body gets a chance to overcome the natural wall of immunity or resistance and an infectious arthritis sets in to complicate matters. The patient's natural resistance then begins to build up and the symptoms diminish until something else happens to start them off again. This accounts for periodic remissions and subsidence which are so characteristic in this type of the disease. The special type I will not go into here, as these cases require special consideration.

There is one other class of condition which deserves some consideration but which may be classed with the nonproductive type. It is the periathritides. This includes simple synovitis, bursitis and tenosynovitis. These may be considered prearthritic and should be treated as an arthritis of the acute type.

If we can be convinced that the etiology of chronic arthritis is generally infectious, we are ready to plan some rational treatment. We then have three objectives in view. First, find the infective focus; second, rid the system of the infection; and, third, restore the joints involved to normal function. All of this sounds fine in theory but can not always be worked out completely in practice.

The orthopedic care of the joints is so well known it is hardly necessary to dwell on it here. Care should be taken, first, to prevent contractures of joints by means of splints, extension or plaster casts. If they are already present, care should be taken to get rid of them as soon as feasible. Sometimes it seems best to wait until some of the acute pain is gone. There is one other point to mention. If possible, never resort to brute force in overcoming a contracture, lest you destroy what joint there is left.

Now as to the more difficult side of the problem. I have found that the orthopedic handling of arthritic joints is relatively simple but it does not go far enough. I have found that pain can be controlled by drugs but, when we discontinue the medication, the pain returns worse than ever. In other words, we have in arthritis a systemic condition, in which aspirin or a knee splint does as much good as a cough syrup in tuberculosis. I have felt for a long time that the real future in the treatment of arthritis lies in bacteriology and serology.

The reason for this belief is that in old chronic cases the removal of foci of infection does not generally give the desired relief that it does in very early cases. This infection, although once primarily present in tonsils or teeth, has been generally disseminated throughout the body and consequently in these chronic cases we no longer have a primary focus alone but in addition multiple foci. It is impossible to reach all of these. Hence our attempt to reach through immunization against them.

The work of Burbank in New York I believe to be constructive, for I have seen enough of his results to satisfy myself of his honesty. It is along this line that I have been working. Burbank's method is briefly as follows: Cultures are taken from every focus of infection available. The foci are then cleared up locally as nearly as possible. The cultures thus obtained are used as antigens in the regular complement fixation test, very much as gonorrheal fixation tests are done. He selects the organism giving a positive fixing reaction and makes up a vaccine for the treatment of the case.

The trouble with this technic for most of us lies in the technical problem involved. We have tried to duplicate this work but frankly were unable to do it satisfactorily thus far. Of course, this method would give us a specific organism with which to develop an artificial immunity toward our infection very much as we can develop an immunity toward typhoid.

So we have devised a substitute method which seems to be working out quite successfully and is much simpler. The foci are located and cultured, using the patient's own blood as culture medium. This principle was borrowed from the work of Cohn of Philadelphia. It is that most of the organisms found in and about a person's body have stimulated an immunity in his blood, making it in a sense a saprophytic. But any organism, especially a streptococcus having remained in the system long enough to produce a marked arthritis, can not have had a great deal of immunity developed against it. Therefore, if this organism with many others of saprophytic nature is cultured out in the patient's blood, it will proceed to grow while the immune bodies in the blood will retard all the others.

These blood media cultures are examined at the end of twenty-four to thirty-six hours and blood agar plates are smeared with the serum. We have taken cultures from teeth, tonsils, pyorrhea, posterior nares, cervix, prostate and stools in this manner and have been surprised at the number of cases in which the streptococcus viridans has been isolated from the blood media serum at the end of thirty-six hours. In some cases we have had contamination but most of those were cases where nothing showed up for forty-eight hours and where the poorest results were later obtained.

I have treated about forty cases with these vaccines and have had some most encouraging results thus far. I will not attempt to give statistics on these cases because most of them are still under treatment and will be for many months.

There is another method of treatment which I have been using as a sort of fill-in. We have used it at the Seattle City Hospital for fifteen months and have collected some seventy-five cases. It is best used in conjunction with vaccines but at the City Hospital we have not used the combined treatment because of lack of proper laboratory facilities. The drug is an ammonium salt of o-iodoxy benzoic acid. Commercially it is known as amiodoxyl benzoate as put up by Abbott Laboratories, Inc., and Oxo-ate A. by Smith Kline and French Co. It is used intravenously in doses of from one-half to one gram, dissolved in normal saline. Some time ago I gave a more detailed report on twenty-four cases in NORTHWEST MEDICINE, to which I can refer any one particularly interested.

I have found that the reactions are quite severe but transient, and no really bad aftereffects have been noted in any cases. If properly given the results are often spectacular and most of them seem to be quite permanent. Our results in seventy-five cases show about 40 per cent in which complete relief was obtained, 45 per cent with marked relief and less than 15 per cent of outright failures. The drug may be given by mouth as a calcium salt but is not as effective as by the intravenous route.

In conclusion, I will say I believe the day will not be far distant when we will have a better understanding of the arthritic patient and his problems, and believe we will be able at least to relieve him of most of his suffering.

OBSERVATIONS ON INJURIES TO THE NECK*

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Ambrose Paré once said, "I dressed him and God healed him." That was in the year 1552, 376 years ago. At that time the practice of medicine was more of an art than a science, and Paré, a peer of his profession, was one of the few who recognized with submission the difference between the results of man's healing efforts and the results of those instituted by nature. He was satisfied with playing the assistant to natural, or I should say, divine powers.

Great strides have been made since his time in the art and especially the science of medicine but still our position as respects service to diseased and injured mankind is in many cases as secondary to the works of mother nature as was his. We are often just as helpless to improve materially her methods as were the ancients. However, we are learning the better to differentiate, the better to select those cases that are in our province, permitting some others to remain in her's. But the mere recognition of the fact that there are cases which are beyond us is doubtless often of advantage to us as well as to our patients for it is sometimes wiser to know what not to do.

Admitting, then, that in some cases we are of no help and that we have reached the stage where we can disclose which types they are, can we be justified in remaining complacent as if believing this our present secondary position in these matters to be a permanent one? No, assuredly not. The whole profession is actively engaged in continually attacking the realm of nature by scouting parties, by sallies, by invasions and by well organized drives conducted by elaborate research laboratories, and, as in the past, the borders of her area are by science being gradually pushed farther and farther back. To what end this progress will go no one can prophesy, but that it will continue there can be no doubt.

But in the meantime, while this battle for supremacy is going on, we are called upon to treat individual cases, many of which seem to fall more properly within the category of nature's remedies than within ours. Progress, if any, with these is very slow, efforts on our part do not seem to help, and the case probably would get along just as well if left alone. The great difficulty, however, is for us to be sure that we have such a case at hand, and can conscientiously let nature do it. These cases bother us a great deal, at least they do me, and one always wonders whether or not something else might have been done for the patient. My experience with such cases has prompted this paper and I hope to get from your discussion some help or else absolution for my management of them.

The cases selected for this discussion are all injuries to the neck. But this area is by no means the only one offering difficulties. The neck is doubly exposed to trauma by reason of its serving as a connecting link between two larger bodies, namely, the head and the trunk. Each, because of its size, is subject to blows and shocks, and these are transmitted through this smaller connection from the head to the body, or vice versa. The weight possessed or momentum acquired by each is so much greater than that of the neck that *it* consequently suffers most. Its flexibility is not enough to permit the sudden angulation often placed upon it and

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* Read before King County Medical Society, Seattle, Wash., Oct. 17, 1927.

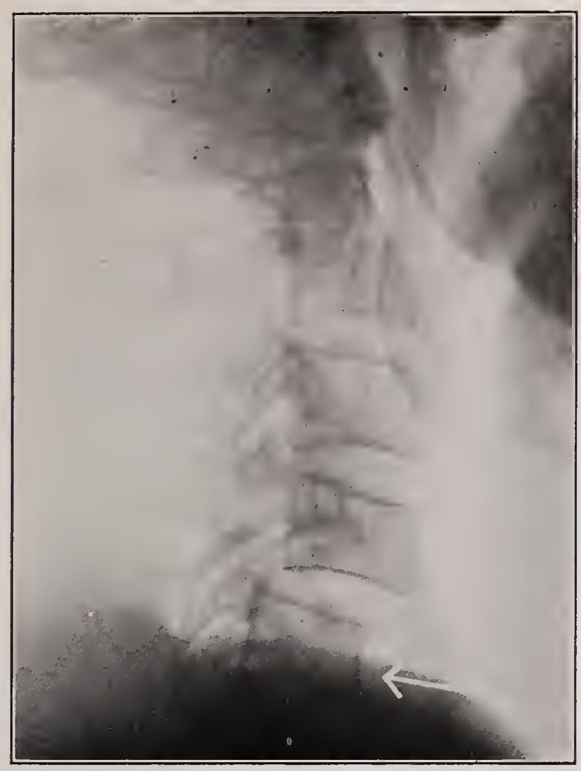


Fig. 1. Showing a forward dislocation of the 4th cervical vertebra on the 5th, before reduction.

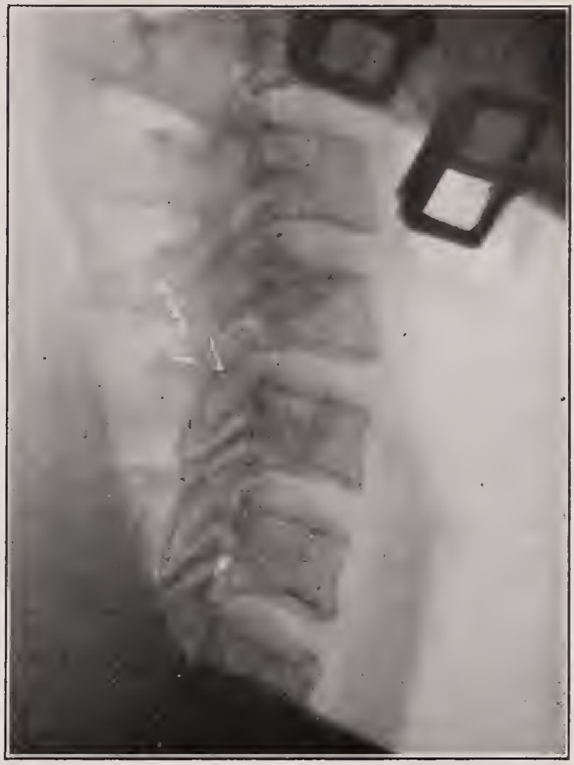


Fig. 2. The same, after reduction.

its strength is insufficient to withstand, unbending, the sudden application of weight. When we consider the mechanics of its function and recognize its exposed position, we are stimulated to wonder why it escapes so frequently. Like a loose coupling between two cars, it bears the brunt.

The first three cases are reported with the others to show that in that type of injury with which scientific medicine can adequately cope we have success. These are reported for the purpose of contrast.

A boy, aged 15, had been pitching ball all afternoon and had become fatigued, when, after glancing at second base, he threw the ball with his head still partially turned to the side. He instantly received a sharp pain in the right side of his neck, and was unable to alter the position in which he found his head. He had rather extreme pain and his head was held rigidly in one position with the chin deviated to the left and slightly elevated.

Clinically, this was a case of one-sided anterior luxation and the radiogram showed this to be the fifth cervical vertebra. Under anesthesia this was reduced and a very satisfactory result was obtained.

The next case, a man aged 50, was held under an overturned car in such a way that his head was forcibly flexed on his trunk. After the pressure had been relieved he complained of pain in the region of his neck and a numbness and heaviness over his left arm, associated with pain over the left shoulder.

The radiogram showed an anterior dislocation of the fourth cervical vertebra on the fifth. Figures 1 and 2 show the bones before and after reduction. He is now well.

The success in these two cases and in this type of case is due to the fact that scientific medicine has not only been able to understand perfectly the nature of the pathology in question, but also learned how to eradicate it. If these were left to mother nature, the results would have been very unsatisfactory.

The next case of a boy, aged 5, demonstrates an extreme case of right-sided torticollis. The right sternocleidomastoideus muscle was markedly shortened and like a fibrous cord was holding his head tipped to the right, face turned to the left, with the chin slightly elevated. This was a birth injury. As a babe he was born in the breech presentation and the father said that the physician directed him to pull on the shoulders to help deliver the aftercoming head. Immediately after the birth it was noticed that the infant held its head turned slightly to one side. Apparently the right sternomastoid muscle was torn, was overstretched, or had a hemorrhage into the structure sufficient to cause it to become fibrosed. This scar tissue failed to grow as fast as the uninjured muscle on the opposite side, producing as a consequence an increasing angulation of the neck to the right. This angle became more acute as the boy grew. The morphology of the cervical vertebrae was also being altered by this abnormal position. Operation was advised.

Operation. The sternomastoid muscle was exposed at its double insertion and both these were completely separated as were all fibrous strands that seemed to be holding the degenerated muscle. After this release the head could be straightened and was held in an overcorrected position by means of a cast. It has been three years since this was done and the boy has perfect movements of his head and neck in all directions. One would not know that he

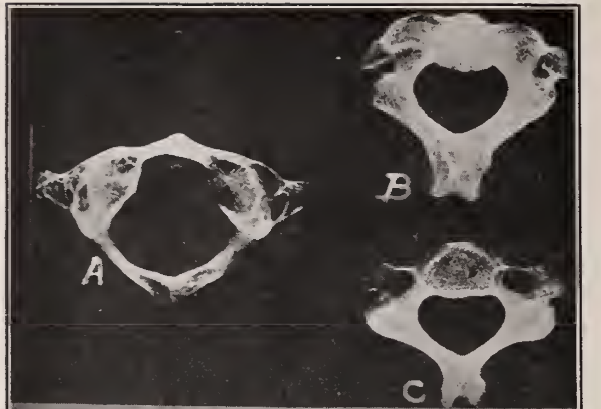


Fig 3

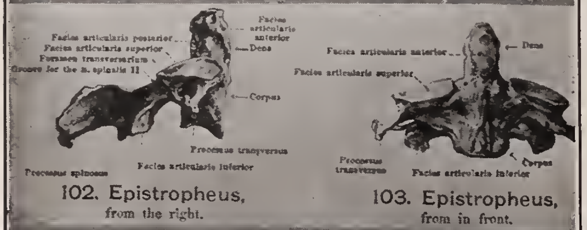

Facies articularis posterior
Facies articularis superior
Foramen transversarium
Groove for the a. spinalis II
Facies articularis anterior
Dens
Corpus
Processus transversus
Facies articularis inferior
Processus spinosus
102. Epistropheus, from the right.
Facies articularis anterior
Dens
Facies articularis superior
Processus transversus
Corpus
Facies articularis inferior
103. Epistropheus, from in front.

Fig 4

Fig. 3. a, atlas; b, axis; c, third cervical vertebra, showing the relative sizes of the canal space circumscribed by each.

had had this injury. This is another satisfactory result due to scientific medicine. This case if left to natural remedies would have resulted in a terribly handicapping deformity.

Before proceeding to the next group of cases, let us consider a few anatomic points of the cervical vertebrae, as well as some aids to the x-ray diagnosis of injury in this region. The spinal canal in the cervical region is much larger at its upper end than at its lower, as shown by the larger space circumscribed by the atlas as compared with the axis and the third cervical vertebra (fig. 3). The odontoid process (fig. 4) arises from the body of the axis or epistropheus, proceeding straight up into the anterior part of the space circumscribed by the atlas. This process encroaches to a certain extent upon the canal space within the atlas, but still the remaining space within this vertebra is much larger than any of the others. The shape of the spinal canal in the cervical region can best be visualized by referring to fig. 5.

George of Boston, in the *Boston Medical and Surgical Journal* of September, 1919, described the use of lines outlining the anterior and posterior borders of the three upper vertebrae as an aid in diagnosing misalignment in these three vertebrae, as shown in fig. 6. Another set of lines is used by him in the anteroposterior position for the same purpose as shown in fig. 7. This method of observation is often of great aid, but its service can be extended to the entire cervical spine by projecting these same lines down throughout the entire length of the cervical region, as shown in fig. 8. It will be seen by figs. 9, 10, 11 and 12 that, whether the neck is hyperflexed or hyperextended, these lines remain parallel and the spinal canal is in no position encroached upon. Frequently this method of observation on the x-ray plate is of great aid.

The anteroposterior radiograph of the cervical spine is of little value in diagnosing fracture or dislocation of these bones, except in the instance of the first two, but the lateral view is of great value, providing of course it is a true lateral. The confusion which might arise from attempting diagnosis from a lateral view that is not a true one can be seen by comparing fig. 13, an untrue lateral, with a true lateral, fig. 14, of the same case.

To proceed, then, with the report of cases, the following ones did not respond so well.

A young woman, aged 30, reported with extreme pain down the right arm and numbness of the fingers. This pain seemed to have its origin in the back of the neck, extending down over the shoulder, front and back part of the arm. There were no physical signs that could be determined. The pain was sharply increased by motion of the neck or shoulder, but continued to ache even when the parts were at rest. There was no tenderness along the course of the nerves. It did not seem to fit in with the "book description" of either neuritis or an arthritis.

X-ray picture of the shoulder was negative. That of the cervical spine showed, to our surprise, evidence of an old cervical (traumatic) arthritis (fig. 15). On more carefully questioning her, she remembered having had a slight injury two years before, when toboganning. Another passenger fell on her head and neck, pushing her head forcibly to the left, but she had had such slight discomfort that she had forgotten about it entirely. Her discomfort lasted for months. We searched for foci of infection but found none. There was no history of pelvic, appendicular or gallbladder symptoms.

For treatment we used diathermy, hot packs, rest, and relieved the neck and shoulder of the weight of the arm by means of support. Gradually and slowly the patient got better. Within three months she complained of nothing but numbness in the index finger, which also gradually had improved.

The results were so slow that I am inclined to believe that our efforts helped very little, if any. Rest alone would have accomplished as much. Can we prophesy that she will have no recurrence, whenever she overexerts that arm or receives an infection?

The next case, a young woman, aged 28, married, was in an automobile accident. After the coupe had turned over she found herself jammed down under the dash, with the other passenger on top of her. Immediately she had excruciating pain in her neck, could not move her head in any direction because of it. For two days she suffered extreme pain, requiring narcotics for relief. She did not dare to move her head the slightest nor to have the bed jarred, on

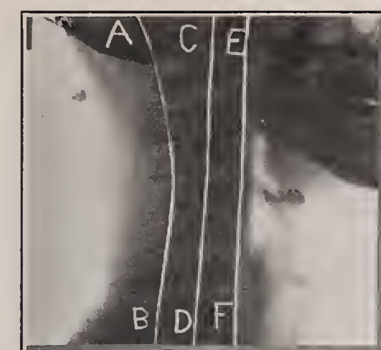


Fig. 5

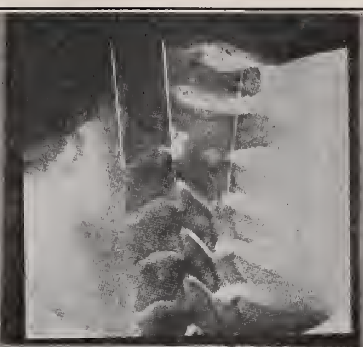


Fig. 6

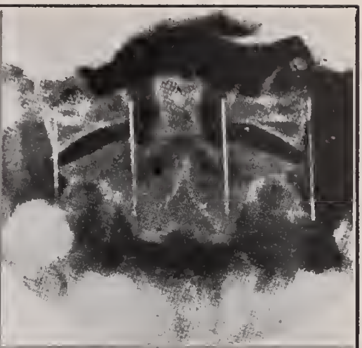


Fig. 7

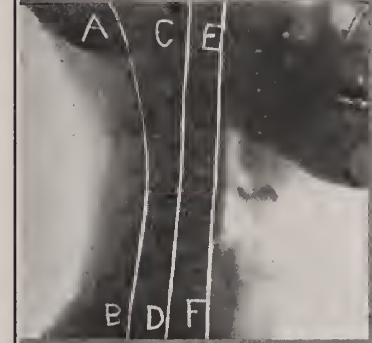


Fig. 8

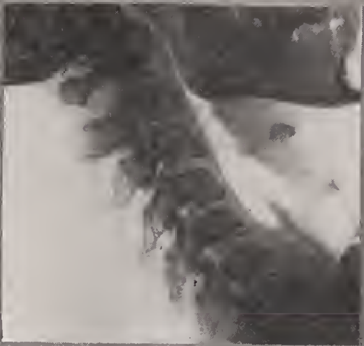


Fig. 9

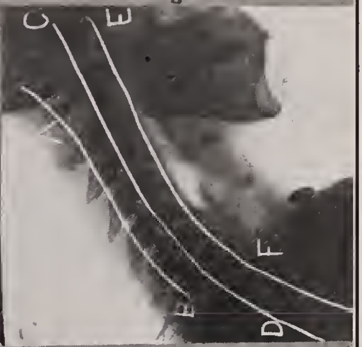


Fig 10

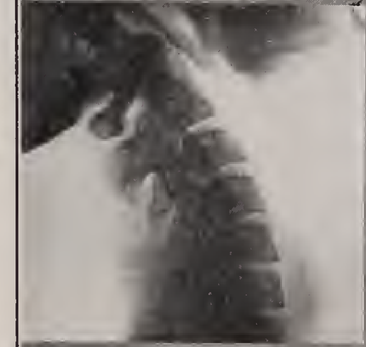


Fig 11

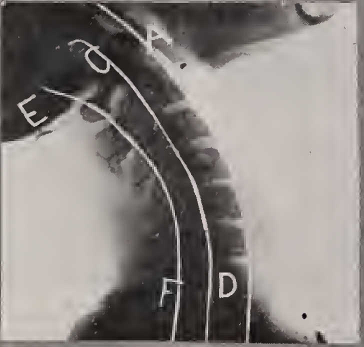


Fig 12

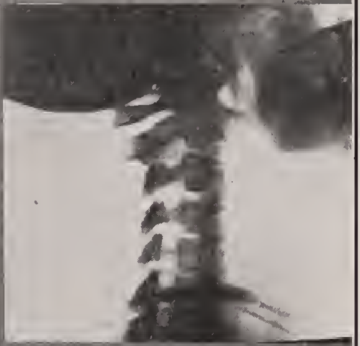


Fig 13

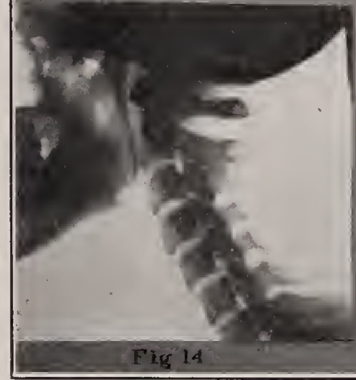


Fig 14

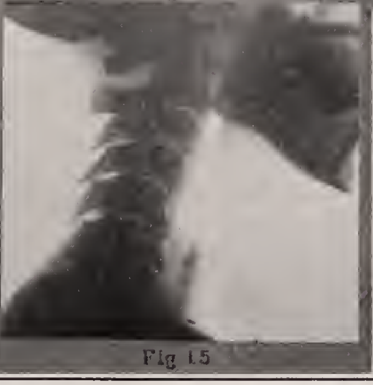


Fig 15

Fig. 5. A true lateral radiogram of the cervical spine. The canal space is outlined by lines AB and CD. The true alignment of the bodies of the vertebrae is shown by the parallel lines CD and EF.

Fig. 6. The lines used by George of Boston as an aid in diagnosing pathology of the first three cervical vertebrae.

Fig. 7. The lines used by George in the anteroposterior view.

Fig. 8. Shows the lines used as an aid in diagnosing misalignment of any of the cervical vertebrae.

Figs. 9, 10, 11, 12. Show the vertebrae in the hyperflexed and hyperextended positions, with and without the lines.

Fig. 13. Radiogram of the cervical spine which is not a true lateral.

Fig. 14. Radiogram of the cervical spine which is a true lateral. Same case as fig. 13.

Fig. 15. Showing evidence of old arthritis.

which she was lying. She had slight pains down over each shoulder but no other neurologic symptoms.

X-ray examination was negative. This was apparently a case of strain or sprain, or diastasis of the ligaments or muscles of the neck. For treatment we instituted a Thomas collar for support and extension, diathermy, hot packs, etc.

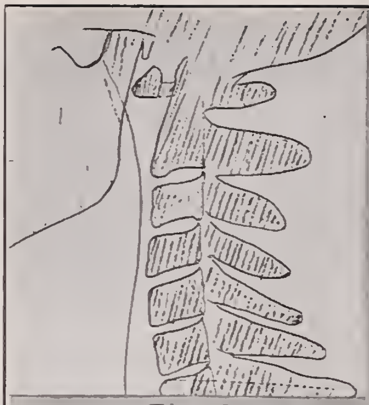


Fig. 16

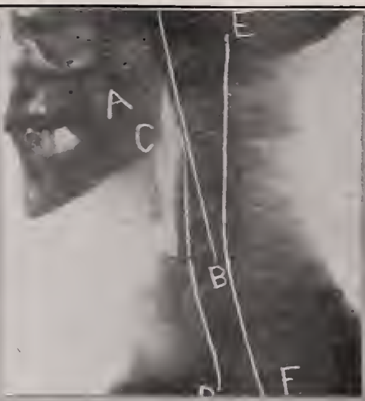


Fig 17

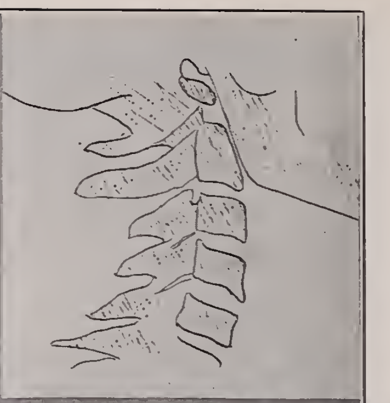


Fig. 18

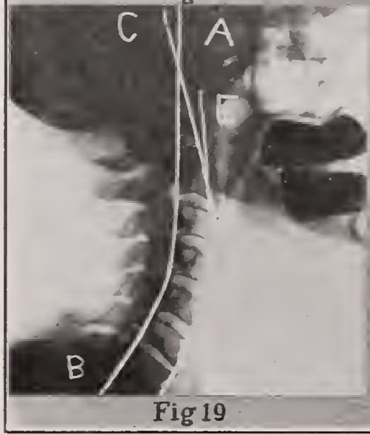


Fig 19

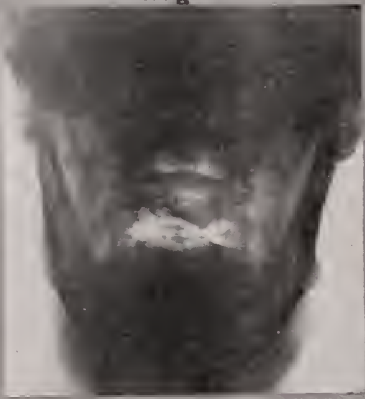


Fig. 20

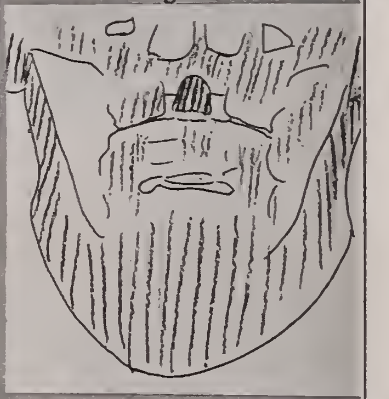


Fig. 21

Fig. 16. A shadowed tracing of radiogram of the cervical spine, showing what seems to be an abnormal distance between the body of the atlas and the odontoid process of the axis.

Fig. 17. The same case showing the abnormal arrangement of the lines.

Fig. 18. A shadowed tracing radiogram of the cervical spine, showing the odontoid process does not arise directly up from the body of the axis, but is pushed back and not clearly outlined because of superimposed bone. In fact, it is not seen at all.

Fig. 19. Shows the poor alignment on the same picture.

Fig. 20. An anteroposterior view of the same case as in figs. 18 and 19.

Fig. 21. A shadowed tracing of the case shown in figs. 18, 19 and 20.

In this case the improvement was very, very slow. While the diathermy was being applied she had temporary relief, but only then. Gradually, however, improvement occurred and after three months she is about normal. I do not believe this case was improved much by treatment. Nature cured it.

The next two cases we will discuss together as they are so similar in signs and symptoms.

Two men, one aged 40 and the other aged 55, received their injuries in automobile accidents. The men complained in each case of having pain in the neck which was exaggerated with slight motion. The distribution of pain in each patient was up over the back of the head and behind the ears and out on the posterior surface of the pinna of each ear, equally distributed on each side, that is, over the distribution of the major and minor occipital nerves. There was also a pain upon motion on each side of the neck down to the shoulders and down the middle of the back. One man complained of numbness in both hands, but this was practically the only difference between the two cases.

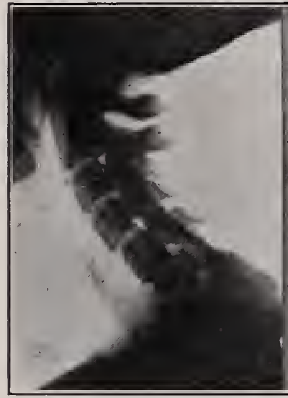
Radiograms of this man (figs. 16 and 17) were debatable, and we repeated these pictures several times, taking stereos from each direction, and were unable to discover definite bone injury. The other man, who did not have the hand symptoms, showed on radiography (figs. 18, 19, 20, 21) fracture of the odontoid process of the axis.

These two cases were treated alike, with extension, braces and Thomas collars, which were at last discarded by the men themselves as not helping much. On one the collar produced a carbuncle at the hair line. I permitted the collars to be removed, inasmuch as I believed the natural reaction that the muscles showed to pain caused them to be always held tense, holding the head in as quiet an attitude as the collars. I tried plaster casts but found they had to be too heavy upon the shoulders to be of any value in extending the neck. These cases were generously treated with diathermy, hot packs and rest, and they have shown slow improvement, the one with the fracture progressing more slowly over a period of two years than the other.

These cases, to my mind, were not improved at all by my efforts. Mother nature had them in charge, creating in her own quiet and gradual manner whatever improvement they experienced.

The last case, a married woman, aged 28, was hit by a motorcycle in November, 1925. She was semiconscious, answering questions fairly well, but it was difficult to hold her attention. She complained bitterly of pain in the back of the neck and numbness in both hands. There was a hematoma on the left side of the forehead. She could not raise her right arm or leg but could raise the left. There was a feeling of numbness about equally distributed in the two hands and arms, possibly more marked in the right. She could not distinguish between heat and cold over the right arm, right side of the body or right leg. Deep pressure sense was retained in these areas, but the patient had no knowledge of the position of the right fingers or toes. All reflexes were hyperactive, but equal on the two sides. There was a double Babinski. She suffered severe pain when her head or neck was moved the slightest.

A temporary diagnosis was made of injury to the spinal cord at the level of the fifth and sixth cervical vertebrae, affecting both sides, but the right more markedly. There was also an associated concussion of the brain. Radiograms were reported negative, but a good lateral view was not obtained.



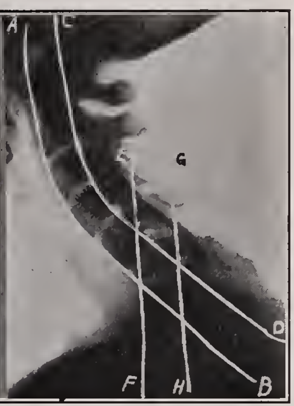


Fig. 22

Fig. 23

Fig. 22. Shows an anterior dislocation of the 5th cervical vertebra on the 6th.

Fig. 23. Same case as fig. 22, showing the radical degree of misalignment.

Gradual improvement in the neurologic picture continued, and after three days in the hospital the double Babinski disappeared. The patient could move her head from side to side without complaint, but pressure on the sixth and seventh cervical spines produced severe pain. Her mental condition improved gradually, permitting her to cooperate better for a neurologic examination. This revealed that she had on the left side a partial paralysis of the flexors and extensors of the fingers, associated with a feeling of numbness in the fingers. Otherwise, the left side was normal. On the right side there was a complete paralysis of the flexors and extensors of the fingers, supinators and pronators of the forearm, and a partial paralysis of the biceps and triceps. There was some weakness in the right foot and leg. The tactile sense was normal over the entire right side, but she was still unable to differentiate betweeen heat and cold over this entire side. There was a partial paralysis of the bladder, necessitating occasional catheterization.

Radiograms were still reported negative, although good lateral views had not yet been obtained. However, she was gradually improving and was able to move her head and neck without pain. On the sixth day the bladder paralysis had disappeared. The right leg seemed normal except for weakness, and heat and cold were well differentiated over the entire right side. The right arm, however, still showed paralysis of the flexors and extensors of the hands, supinators and pronators. Objects placed in the right hand could not be named. The symptoms in the left hand gradually disappeared. Slight pain persisted over the sixth and seventh cervical spines on pressure or when she had to lift her head from the pillow. Eye grounds had been negative from the start.

Inasmuch as the condition of the right arm did not seem to be improving as rapidly as the rest, the husband was notified that an operation on, or manipulation of the cervical spine might be necessary in order to give that arm the most favorable chances for recovery. He, however, insisted that neither be done unless it was to save her life. Consequently nothing was done.

Patient left the hospital December 7, seventeen days after her accident, presenting a slight weakness in the left hand, but no sensory disturbance, and slight weakness in the right leg, but all the motions retained. The right hand still presented paralysis of the fingers, astereognosis, weakness of the pronators and supinators, but the biceps and triceps paralysis had practically disappeared. In fact, there had been a gradual improvement in all the original neurologic symptoms and signs.

Two years after her accident the patient was in good health, walking about, doing her housework, with no ataxia or limp, and was without pain, complaining of a drawing sensation over the right shoulder and that her right hand does not permit her to use it for writing or sewing (figs. 22 and 23).

Three years have elapsed since this patient received her injury and she notices only that her writing is not as good as it was, but practice has improved it considerably. Here we have almost complete recovery despite such a marked bony displacement. Had we reduced the dislocation, which procedure itself is not devoid of danger to life, or neurologic elements, it is debatable whether more rapid recovery could have been obtained. Of course, we were ready to offer the application of scientific knowledge (that is reduction of dislocation) to the presenting pathology, but consent was withheld. After all, had permission been given, could the result have been bettered? This again is a case in which nature instituted the therapeutics and science stood by and watched.

SUMMARY

1. The neck, by reason of its location and function, connecting two larger bodies, is subject to trauma.

2. Gross bony lesions are usually more satisfactorily treated than those in which bone injury is not demonstrable, such as sprains, strains, etc.

3. Scientific medicine, so-called, has as yet no treatment that improves on nature in caring for sprains, strains, etc., of the neck.

4. X-ray diagnosis is inaccurate without true lateral view. Many views may have to be taken to establish the permanence of a defect.

5. The system of parallel lines, suggested by Dr. George of Boston, is of value in interpreting bony misalignment of the entire cervical spine.

TRANSPLANTATION OF THE ENTIRE FIBULA TO REPLACE THE TIBIA

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About three years ago there came under our care two children, approximately eleven years of age, both of whom had had osteomyelitis of the tibia and in both instances, owing to various operative procedures that had been done, there was a tremendous loss of bone substance, so much so that it seemed unlikely that the ordinary bone graft operation would be successful. In the case of the boy a bone graft operation was attempted which completely failed and the graft had to be removed. In both instances we finally resorted to a transplantation of the fibula, in order to take the place of the absent tibia.

In each instance the upper end of the fibula was transplanted across into the upper fragment of the tibia, the leg put up in a cast, and the healing allowed to be complete with good solid bony union before any effort whatever was made to do anything

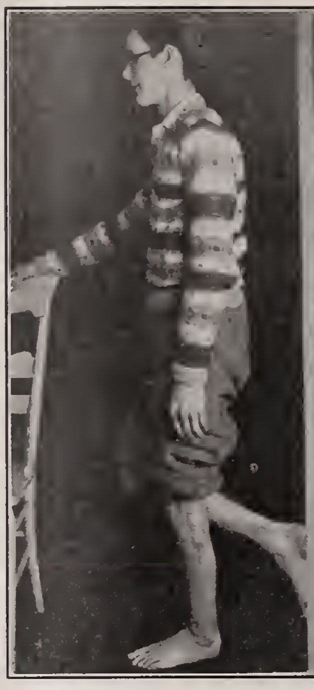

Fig. 5

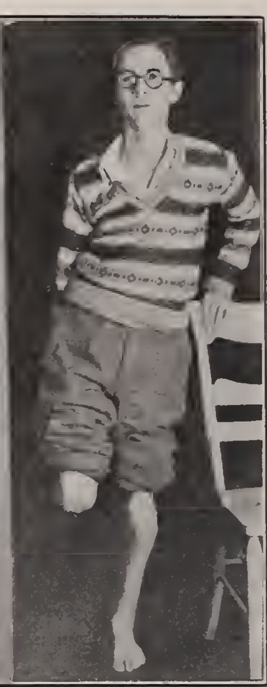

Fig. 6

Fig. 5. D. P. Taken three years after the transplantation of fibula.

Fig. 6. D. P. Taken three years after the transplantation of fibula.

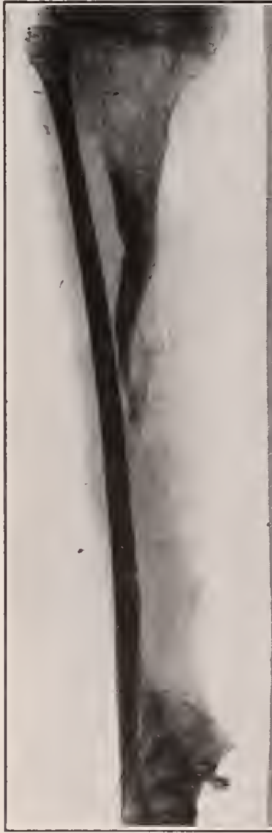

Fig. 1

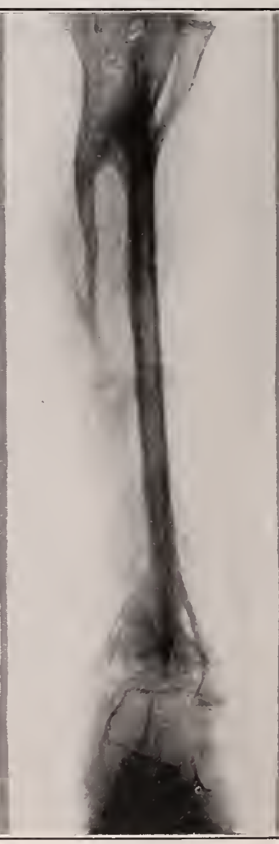

Fig. 2

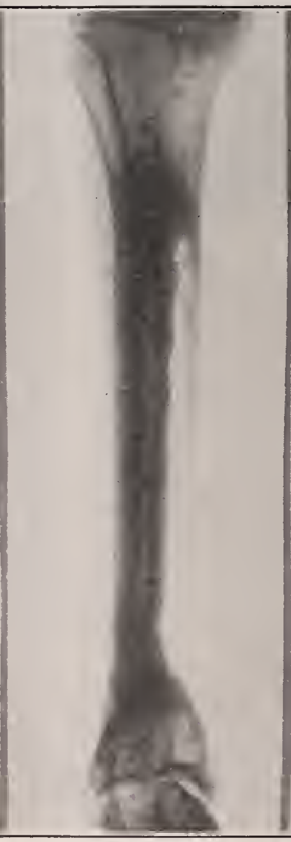

Fig. 3

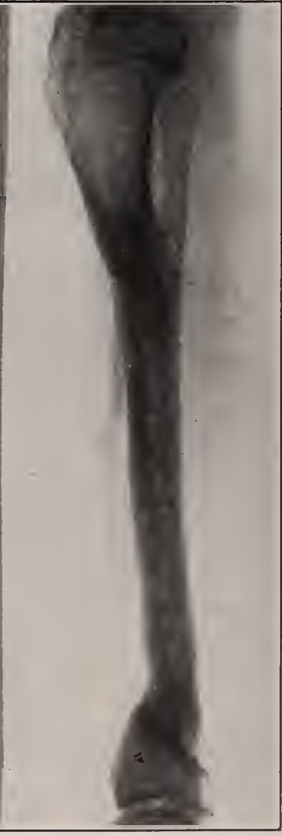

Fig. 4

Fig. 1. D. P. Marked loss of tibia from osteomyelitis. Bone graft from the tibia was attempted and failed.

Fig. 2. Taken about five months after the transplantation of fibula.

Fig. 3. D. P. Three years after the transplantation of fibula. Compare size of transplanted fibula with that in fig. 2.

Fig. 4. D. P. Condition about three years after transplantation of fibula. Note how the remaining portion of the fibula is made to act as a brace for the new tibia. The transplanted fibula is nearly three times the original size.

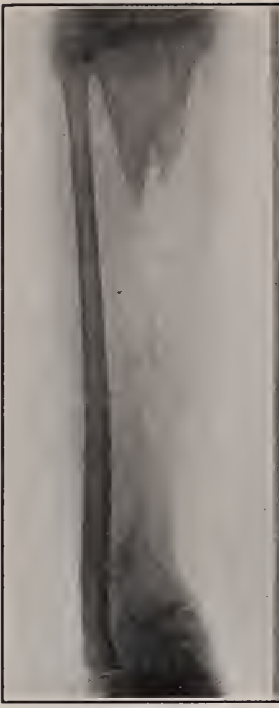

Fig. 7

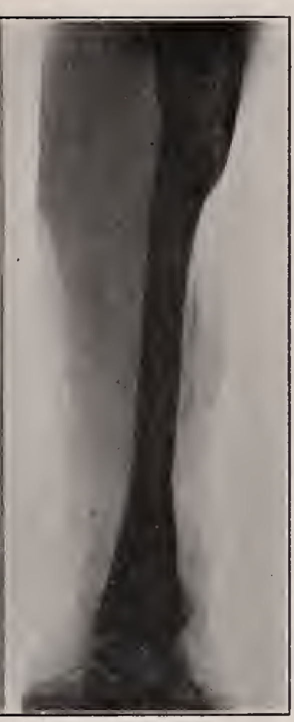

Fig. 8

Fig. 7. T. J. Gross loss of tibia from osteomyelitis.

Fig. 8. T. J. Appearance of transplanted fibula about two years later. Transplant is more than double the original side.

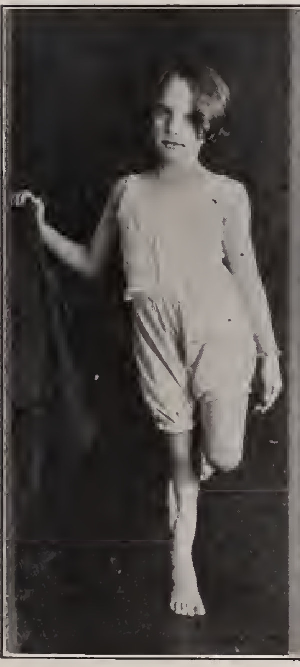

Fig. 9

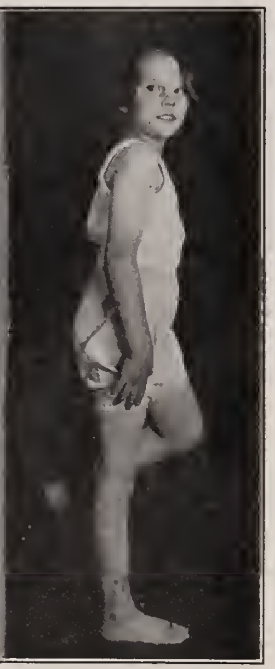

Fig. 10

Fig. 9. T. J. Three years after the transplantation of fibula.

Fig. 10. T. J. Taken three years after the transplantation of fibula.

with the lower fragment. After union was complete, at the site of the transplanted end of the fibula into the upper fragment of the tibia, the same procedure was resorted to in the lower end of the tibia, that is, the fibula was divided and transplanted across into the remaining portion of the lower end of the tibia.

By referring to the illustrations the condition will be noted that existed before the operation and also the very excellent union that has taken place since. In both instances the fibula has enlarged to such an extent that it takes the place very well of the absent tibia.

This operation is a comparatively simple one to perform and is not subject to the difficulties that are encountered in the ordinary bone graft. As a matter of fact, this could hardly be regarded as a bone graft at all, since the entire fibula is living bone, only the upper end being transplanted. Nn effort whatever is made to loosen the fibula, excepting at the upper and the lower extremities. Healing takes place very quickly, just exactly as it would in the ordinary fracture. Following out Wolfe's law, the fibula enlarges so that eventually it is practically as strong as the tibia that was lost.

The various illustrations show the condition of the two children following the operation. Both these children are now perfectly well and able to walk without any external support whatsoever.

TOXIC GOITER

FACTORS THAT INFLUENCE MORTALITY AND MORBIDITY

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Since the general use of Lugol's solution as an adjunct to the treatment of the toxic goiter patient, the mortality from operations on the thyroid gland has been reduced to a very low percentage. Surgeons in general feel more secure in undertaking the operation and public confidence has been established to a rather high degree. The results of the surgical removal of the toxic goiter are as a rule so strikingly beneficial, that something near a wave of enthusiasm for the procedure has fastened itself on the minds of both the profession and the public. There is an element of danger in this situation that is similar to that which prevailed when operations for the removal of the appendix and teeth were so popular. Needless operations on the thyroid will not increase the mortality percentage, but will lessen the percentage of cures.

The mortality rate, as reported by the men of larger experience in the past few years, averages from one-half to three per cent. However, I do not believe this is sufficiently high, if the percentage were calculated from the total number of goiters operated upon throughout the country. The mortality rate, taken from the records of the individual surgeon or from those of the surgeons of the entire country, will depend upon many factors but three only will chiefly affect that average, namely, first, upon the character of risk accepted for operation; second, upon the care with which the patient is prepared for operation; third, upon the postoperative treatment. The percentage of cures obtained will be affected by somewhat different factors, chiefly the duration of the disease and the removal of the proper amount and kind of tissue.

The following report and discussion is taken from a personal experience with more than eight hundred partial thyroidectomies, performed in the past four years. Relatively ten per cent of these operations were performed for simple adenomatous goiters or were in an arrested state at the time of operation. The remainder include all grades of risks from the best to those on whom the operation was performed under extremely grave conditions. It is among this group that nine of the total of eleven deaths occurred, a death rate of one and four-tenths per cent in eight hundred operations.

The causes of death were as follows:

Hypertrophied crises	2
Badly damaged heart (myocardial degeneration)	6
Auricular fibrillation	
Heart failure	
Hypertension	
Nephritis	
Cerebral thrombosis	1
Anesthesia	1
Pneumonia	1
Total	11

Age sequence was as follows:

20 to 30	1
30 to 40	1
40 to 50	1
50 to 60	2
60 to 70	5
Over 70	1

A further discussion of the operability of the above cases seems justified.

The youngest patient, a girl of twenty-five, died of a typical and severe hypertrophied crisis. The duration of the disease was ten months. Her basal metabolic rate was plus 102 per cent. After seven weeks in bed with Lugol's solution and forced feeding, she had gained seven pounds. Her response, however, to treatment was less striking than is usually observed.

During the operation, her pulse rate rapidly rose to 180 and only half the gland was removed. She made no response to the usual methods of combatting hyperthyroid crises. During the ninety hours she lived her pulse rate was at no time less than 180, and a greater part of that time it ranged over 200. A remarkable fact is that, despite the terrific rate this heart was racing, at no time did it show the slightest irregularity; an excellent example of the ability of the youthful heart to stand stress, and it stands out in striking contrast to the behavior of hearts of toxic goiter patients operated on past the age of sixty.

The rule is that auricular fibrillation will develop postoperatively in toxic goiter patients past sixty years of age. It is not necessarily an alarming symptom, but cannot be interpreted otherwise than as an evidence of a damaged heart. There are all sorts of exceptions to this rule. I have observed patients with fibrillating hearts that made little or no response to rest in bed, Lugol's solution, digitalis or quinidine, but became quite regular in a few hours after operation, and remained so thereafter. A doctor friend of mine tells me that while operating on such a case, the heart became regular during the operation and so remained.

The six deaths which are listed as due to heart failure, damaged hearts, auricular fibrillation, hypertension and nephritis, readily fall into one group. They represent the end-results of long standing, highly toxic adenomatous and exophthalmic goiters. They all had badly damaged and dilated hearts. Five had auricular fibrillation preoperatively, and all had it postoperatively. Three had albumin and casts preoperatively. All had hypertension, ranging from 160 to 240. All had had decompensated hearts. In other words, these people represented wrecks of the disease.

One might question the quality of judgment which elected to operate upon these patients. In answer, they represent six only of a group of more than ninety patients, the balance of whom survived operation, and many of whom are now leading active lives. Several of that balance, however, have since died of heart failure, apoplexy, angina pectoris, pneumonia, etc.

I find no cause to quarrel with the surgeon who takes the position that every toxic goiter is to be considered operable unless complicated by some hopeless condition, such as advanced nephritis. Only three patients in the past four years have been refused operation. One other, about whom I had serious misgivings, very obligingly refused operation. She, along with the three, is now dead.

The second patient to die of a hyperthyroid crisis had lost many pounds in weight. She developed an intense hyperthyroid reaction postoperatively. She may not have been given sufficient preparatory treatment.

The anesthetic death represents one of the tragedies of the operating room. It occurred in a strong, healthy woman of thirty-five, who had a simple, moderate-sized nontoxic adenomatous goiter. She was given ethylene and oxygen anesthesia, but did not take it well. Carbon dioxide gas was given as an adjunct to stimulate respiration. The patient suddenly died during the early stage of the operation. In this series of 800 operations the above is the only instance in which carbon dioxide gas was used in combination with the anesthetic. I am not competent to discuss carbon dioxide as an adjunct to gas anesthesia and cannot otherwise discuss it without prejudice.

The patient who died of pneumonia was aged sixty-three. She had a large substernal adenomatous goiter of twenty-two years duration, with a history of toxic symptoms for eight years. She had a badly damaged and dilated heart with auricular fibrillation. Urine of low specific gravity contained albumin and casts. On the seventh postoperative day, while otherwise doing well, she developed signs of bronchopneumonia and died in forty-eight hours.

The patient, a woman of thirty-one years, who died of cerebral embolus, developed an unusual train of symptoms thirty-six hours after operation. While otherwise doing well, she suddenly became comatose and developed a complete unilateral paralysis of the right side of her body. The period of coma was of short duration and when consciousness returned she was totally blind. The blindness, within one hour, resolved itself into unilateral blindness in both eyes. She was able to recognize people and objects on one side of her bed, while able to see nothing on the other side. This state persisted until her death, forty-eight hours later. Coincident with the partial return of vision the paralysis disappeared. Her temperature gradually rose from 102° at the onset of the above symptoms to 107.5° just before her death.

It is difficult to conceive just how an embolus could reach the brain from a thyroid operation, but I have no more rational explanation for occurrence of the above symptoms than by embolism. No autopsy was held. I know of no other parallel experience to this and do not believe it need be reckoned with or taken into account as a complication of thyroid surgery.

In reviewing the eleven deaths from the standpoint of operative risks, they may be classified as follows:

Good risk	1
Serious risk	3
Poor risk	7

No such classification has been made on the records of the patients, and, therefore, I must write of impressions. However, it is my belief that fully fifty per cent of all the cases operated on may well be classed as good risks. On that basis, 400 patients were good risks, of which number only one died and that due to the anesthetic. I think one is warranted in the conclusion that deaths should not occur in good thyroid risks.

Occasional hyperthyroid crises of a severe or intense degree are encountered, despite Lugol's solution. They sometimes occur unexpectedly or where the symptoms were not of such a nature to justify the anticipation of such a crisis. Crises of an alarming degree are not common and with proper management practically all can be controlled. As long as patients present themselves for treatment in the late stages of toxic goiter, after hearts are dilated, after myocardial degeneration has taken place, not only in the heart muscle but also in the entire musculature of the body; after hypertension has developjed, and vascular and renal changes have taken place, there will continue to be a definite mortality in such operative risks and though percentages of deaths can be kept at a low figure in this group, the irreparable damage that has taken place will leave none of them 100 per cent normal.

The results obtained in patients in the advanced stages of the disease are often most strikingly beneficial. I do not believe surgeons will be able materially to improve upon the present results until the symptoms of toxic goiter, be it adenomatous or exopthalmic, are more generally recognized in the early stages and the patients brought to operation before irreparable damage has taken place.

SEVERE ANEMIA ASSOCIATED WITH TOXIC GOITER

REPORT OF A CASE

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A careful search of the literature fails to disclose any but moderate degrees of secondary anemia in cases of hyperthyroidism, except in anemias due to other pathology coexisting with, but independent of the presence of toxic goiter. In adenomata of the thyroid gland, in which degeneration is present, more marked anemia may occur. In a personal communication to the author, Dr. F. A. Willius of the Mayo Clinic has described such a condition and it is in such a category that the following case may be considered.

Mrs. C. L. N., a white married female of 54, was first seen on November 17, 1925. She and three sisters were born in Switzerland; all three of the sisters have large goiters, one of them at present being very ill from a cardiac upset, presumably due to hyperthyroidism. The patient has one child 30 years old, and has had one miscarriage. A normal menstrual history ended nine months ago, since which time there has been no flow. She has always had good health.

For the past ten years or more a goiter has been evident, but has caused no noticeable symptoms. Since the goiter was first discovered, a very gradual increase in size has occurred. Some intolerance to hot weather has been present. No particular nervousness, swelling of the ankles or palpitation of the heart have inconvenienced her. No genitourinary, gastrointestinal or pulmonary symptoms have been manifest. Her appetite is good and her weight increasing.

Physical examination: The patient is well developed and nourished, with moist skin and mucous membranes of good color. Dental work is present in the mouth, but the gums are healthy. Tonsils are moderately enlarged and infected. In the thyroid region are multiple firm adenomata, 4 by 4 inches on the left side, and 4 by 6 inches on the right. No thrills or bruits can be detected. The heart is normal in size, sounds and rhythm. The lungs and abdomen are negative, save for a large nodular mass palpable deep in the right iliac fossa. No tenderness can be elicited on deep pressure. On pelvic examination a large, hard nodular mass is felt which fills both vaults, extending higher on the right. It is freely movable and is not tender on manipulation. Undoubtedly this mass consists of uterine fibromyomata. The cervix is normal. No tremor of the fingers is present. All reflexes are normal. Systolic blood pressure registers 170 mm.; diastolic, 90 mm. The pulse rate is 90. No basal metabolic rate was taken.

On this examination it was felt that the goiter was probably periodically mildly toxic. Thyroidectomy was advised but declined.

The patient was next seen three and one-half months later. At this time definite symptoms of hyperthyroidism were present. Marked tremor of the fingers and loud bruits over each superior thyroid pole were evident. Some gastric disturbance with occasional nausea and vomiting had persisted for about two weeks. Over this period approximately 20 lbs. of weight were lost. Exophthalmos and auricular fibrillation now existed. The heart borders were increased in extent to both right and left. The temperature was 100.5°, pulse 120, and blood pressure 180/110. The hemoglobin registered 29 per cent, the red cell count 1,720,000, and the white cells 3,400. The patient lay propped up in bed, very restless, dyspneic and coughing constantly. She was admitted to hospital, but wished to return home after twenty-four hours. No metabolic rate was taken.

After three weeks rest in bed at home with ice cap over the precordium, opiates and digitalis, no improvement was evident. Diarrhea and more severe nausea and vomiting had supervened. All symptoms were markedly increased in severity.

She was again admitted to the hospital on March 19, 1926. The hemoglobin was now 24 per cent, the red cell count 1,264,000, and the white cells 6,400. The temperature was 101° and the pulse rate 130. On the afternoon of the day of admission 750 c.c. of citrated blood were transfused. Forty-eight hours later, after forcing fluids and administering 45 minims of Lugol's solution daily, marked amelioration in all symptoms occurred. The temperature now ranged below 100°, and the pulse remained at 90. Vomiting and diarrhea had ceased entirely.

On April 1, four and one-half months after the first examination, the hemoglobin estimation was 38 per cent, the red cell count 1,472,000, and the white cell count 6,000. On the morning of this day thyroidectomy was done under local anesthesia (0.5 per cent novocaine). No technical difficulties were encountered. The pathologic diagnosis was "multiple colloid and fetal adenomata in a colloid goiter." In the histologic examination a moderate degree of thyroiditis was noted, together with numerous areas of desquamated epithelium within the follicles. The clinical diagnosis suggested multiple adenomata in an exophthalmic goiter.

No untoward postoperative reaction took place, and the convalescence was uneventful. On the sixth postoperative day another transfusion of 750 c.c. of citrated blood was given, and the next day the patient was dismissed.

When seen one month after operation the hemoglobin registered 70 per cent, red count 4,000,000, white count 6,600. Appetite was good, no nervousness present, and a marked gain in strength was evident. Fifteen pounds had been gained in weight. Pulse, temperature and respiration were normal. Systolic blood pressure now reached only 130 mm., the diastolic 90 mm.

One year after the thyroidectomy, subtotal abdominal hysterectomy was performed for multiple fibromyomata of the uterus. At this time blood pressure determination recorded 135/96; the hemoglobin estimation 90 per cent, red count 4,400,000, and white cells 7,000. From this operation the convalescence was uneventful. In the interim 50 lbs. had been gained, and her health was excellent. All hyperthyroid symptoms were absent. The patient had never had any symptoms referable to the pelvic tumor except a dull, low, lumbar backache and occasional mild sensation of weight in the pelvis.

The history in this case, coupled with the subsequent violent clinical course, would establish the diagnosis of an acute exophthalmic goiter superimposed upon mildly toxic thyroid adenomata. This classification perhaps seems unnecessarily involved and cumbersome, and recent opinion would classify every toxic thyroid state similarly, all being merely variations in degree of toxicity. In this patient, however, the rapid onset of exophthalmos, bruits over the gland, auricular filbrillation, vomiting, diarrhea and rapid weight loss would suggest the diagnosis of exophthalmic goiter. The pathologic findings are not inconsistent with this opinion.

It is noteworthy that the blood picture returned to normal soon after thyroidectomy, despite the presence of symptomless uterine fibromyomata. This is conclusive evidence that the tumor played no part in the production of the anemia.

As a rule, severe cases of exophthalmic goiter, whether or not in a crisis, have a normal blood picture or secondary anemias of only moderate grade. It is reasonable to conclude that the sudden exacerbation in degree and change in character of the toxic state, associated with the presence of degenerating adenomata and an acute crisis, led to the production of such a pronounced degree of anemia.

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CONSIDERATIONS ON SURGERY OF PULMONARY TUBERCULOSIS *

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SEATTLE, WASH.

I wish to bring out and stress certain points in what is the newest field of surgery, as well as the latest aid in the treatment of tuberculosis. In this country the procedures have been used only a few years, although the first cases were operated on in Germany shortly before the war. It is not my intention to speak of the history and development of the operations except briefly, where it may be helpful for a clearer understanding. The indications for each vary to some extent, and may better be mentioned separately with the various procedures.

The treatment of pulmonary tuberculosis is essentially medical and must remain so. We can not cut away and remove the diseased lung, even were this desirable, and our efforts must be confined to making conditions favorable to the healing of the infected areas. There is, of course, nothing new about this. It is and has been the aim of the medical man since the disease was first understood and intelligent treatment begun.

With the advent of artificial pneumothorax for selected cases, this goal would have been realized, were it not for the fact that nature, in her efforts at healing, not infrequently attaches the lung to the chest wall and the diaphragm. These facts have been repeatedly emphasized, and I mention them again so that no one may lose sight of the fact that the surgical procedures are simply steps in the medical management of the disease. It naturally follows that the internist, who has directed the treatment and followed closely the progress of the case, should select the operation to be performed, and indicate just what he wishes accomplished.

INTRAPLEURAL PNEUMOLYSIS

The first condition requiring surgical help in bringing about pulmonary compression will probably be in the case in which artificial pneumothorax has been instituted, but where, in spite of long though cautious trial, one or several narrow adhesions to the chest wall prevent satisfactory collapse. This is particularly apt to be over a cavity. While this type of case is much less frequent than that in which there are dense and extensive adhesions, it presents a problem in some respects more difficult.

Jacobaeus, in 1913, brought out the method of severing these bands with the cautery through a thoracoscope, just as one might cauterize an area in the bladder through the cystoscope. His results at first were not nearly so good as later after he had had more experience, and recognized the kinds of adhesions one should leave alone, that is, the thick, broad type. The chief dangers from this procedure are hemorrhage from vessels running in the adhesions and empyema, either tuberculous or mixed in type, from the opening of the lung parenchyma, which may extend some distance into the adhesion.

The method has so far met little favor in this country, because of these complications and of a variable percentage of failure to bring about the desired results. Some men have even advocated opening of the chest, and the ligation and division of these bands as preferable. Others recommend thoracoplasty, either over the area to which the adhesions attach, or a complete operation. The procedure has still to become generally recognized, though with the improved thoracoscopes in the hands of those who are devoted to the operation, some beautiful results may be obtained.

PARALYSIS OF THE HEMIDIAPHRAGM

We next come to the consideration of the permanent paralysis of one-half the diaphragm through phrenicectomy. In 1911 Stuertz first proposed division of the phrenic nerve in the neck, or phrenicotomy. It was found, however, that in a large percentage of cases the diaphragm was paralyzed for only a relatively short time, often incompletely, after which it resumed its function. This was later determined to be due possibly to regeneration of the nerve, or to the accessory phrenics present carrying on the impulses. Even after a relatively large section of the nerve has been removed in the neck, regeneration may occur, while in from twenty to forty per cent of cases the accessory nerve or nerves will carry on the function.

The chief and most constant one of these runs down usually with the nerve to the subclavius muscle, or at times separately, and joins the main trunk about six or seven cm. below the first rib. More rarely other small bundles have been found to anastomose in similar fashion. It being evident that phrenicotomy, or simple division of the nerve in the neck, could not be depended on to produce permanent paralysis of the hemidiaphragm, Goetze in 1921 described an operation in which the accessory phrenic, as well as the phrenic, is divided in the neck and sections removed.

Shortly after Felix described the operation of

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* Read before King County Medical Society, Seattle, Seattle, Wash., Feb. 6, 1928.

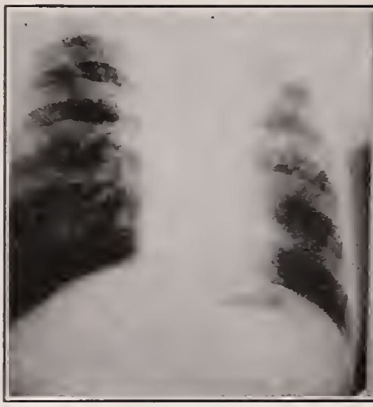

Fig. 1

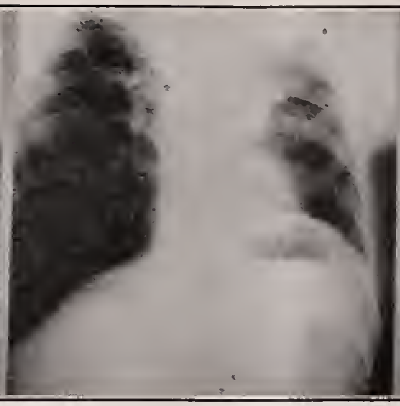

Fig. 2

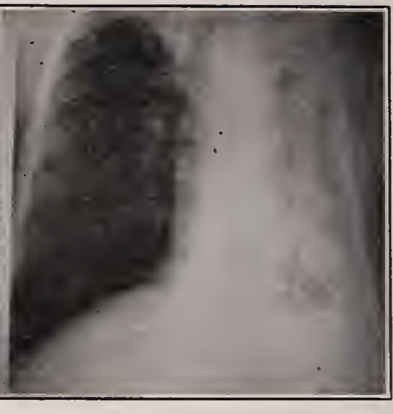

Fig. 3

Fig. 1. J. H. Before operation. Note position of left diaphragm.

Fig. 2. J. H. After phrenicectomy. The great rise of the diaphragm can easily be seen.

Fig. 3. J. H. After thoracoplasty.

"exeresis," in which, after dividing the nerve in the neck a large section or the entire length is extracted, thus breaking up all possible connections with accessory nerves, and precluding any return of function. While both methods have their advocates, the majority of surgeons favor the Felix operation, since if between twelve and fifteen centimeters of the nerve be removed, one is sure to have broken up all existing communications. Not infrequently, those performing the Goetze method must resort to the extraction of the nerve, due to inability to locate or make certain of the presence of an accessory branch.

Phrenicectomy may be easily performed under local anesthesia and with practically no pain. During the extraction of the nerve, one may give a little gas, but I have never found it necessary. The incision leaves an insignificant scar, and the operation is well borne even by patients who are quite sick. In most cases one may with care obtain the entire nerve. The longest one I have removed measured thirty-six cm.

There have been reported some deaths from the procedure. Sauerbruch and Denk among others have had fatalities from wounding of the subclavian artery or branches of the thyroid axis. It has been necessary at times to ligate the subclavian artery or vein, following injury. Air embolism has occurred, as well as wounding of the thoracic duct. These dangers are present in simple phrenic section as well as in exeresis.

In addition, in the latter operation the subclavian vein may be torn, due to the fact that the nerve rarely passes in the wall of or through the vein, or because the accessory branch at times encircles it in joining the main trunk. The nerve may not lie in the customary position, and there have been numerous instances of section of the vagus or other nerves mistaken for the phrenic.

Nevertheless, these accidents are most uncommon, and form only a fraction of a per cent in the total number done. During the extraction there may be cardiac or respiratory distress and disturbance, which if continued should be the signal to stop with as much as one has succeeded in removing.

INDICATIONS FOR PHRENICECTOMY

The paralysis of the hemidiaphragm is immediate, and it assumes a higher position in the chest. Later, as the muscle atrophies, it rises still further, due to the difference in pressure between the abdomen and chest. It may continue to ascend in the thorax for a number of weeks, or in exceptional instances for as long as a year.

The lung at once is partially put at rest, and as the diaphragm rises it causes a variable amount of pulmonary compression. This is most marked at the base, but its effects are transmitted to some extent to the entire organ, in the absence of many pleural adhesions, and particularly, where healing with scar tissue is taking place, the action tends to be selective. The capacity of that side of the chest is reduced by from ten to twenty per cent and even forty per cent has been reported.

The clinical course is often favorably affected in a short time, and surprising benefit may take place. The sputum is increased for a few days or a week, due to the compression, after which it tends to diminish until the daily amount may be as low as ten per cent of the previous total. The sputum is in most cases also easier for the patients to raise, and we have been unable to find unpleasant effects from the high position of the diaphragm.

The indications for phrenicectomy are many and,

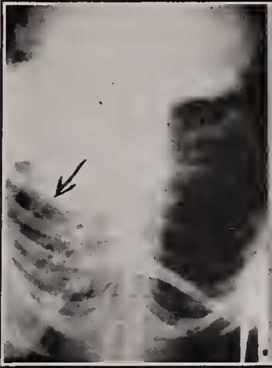

Fig. 4

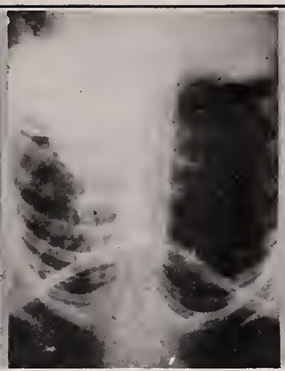

Fig. 5

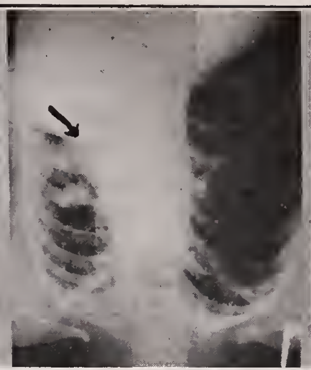

Fig. 6

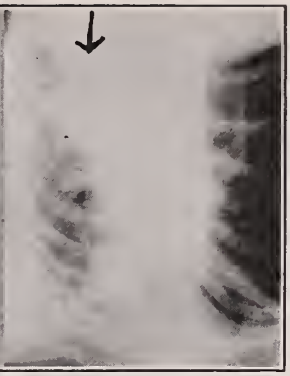

Fig. 7

Fig. 4. V. K. Before operation. Arrow indicates position of diaphragm.

Fig. 5. V. K. After phrenicectomy. Note rise of left diaphragm.

Fig. 6. I. B. Before operation. Here one may see the diaphragm already considerably elevated by adhesions.

Fig. 7. I. B. After phrenicectomy. Diaphragm has risen still further and has obliterated almost half the thoracic cavity.

due to the ease of performance and the fact that it is relatively a minor operation, it may be used where more formidable steps are inadvisable. It should seldom be employed alone for curative effect, but usually in combination with some other procedure. In basilar tuberculosis it is ideal, as it here directly relaxes and compresses the diseased lung. If necessary and feasible, pneumothorax may be used in addition.

As an aid to artificial pneumothorax it is valuable in several respects. The combination may make thoracoplasty unnecessary in some cases. Where there are extensive adhesions at the base it is of great benefit, and also where the lower lung threatens to adhere to the chest wall. In cases of persistent hemoptysis, which pneumothorax does not control, the rise of the diaphragm may relax adhesions sufficiently to diminish or even check the bleeding.

Supplementary to a pneumothorax which is entirely satisfactory, it is often of benefit, and is recommended by a good many authorities. When the lung has healed under the compression of pneumothorax, and so is necessarily more or less fibrotic and shrunken, and the air is finally allowed to absorb, a high diaphragm which reduces the capacity of the chest may often prevent the tearing open of cavities and of tubercles which have been walled off by scar tissue, which would otherwise occur if the lung were forced out to fill the space it formerly occupied.

The operation may also be of assistance in lessening the frequency of refills necessary, even to doubling the interval, and in case the patient abandons the pneumothorax before treatment is completed, the higher diaphragm is of benefit in holding some of the ground gained. It is stated that there are fewer and smaller effusions with the combination of the procedures. This is important when one considers that in approximately fifty per cent of artificial pneumothorax cases there is an effusion of some extent.

The use of phrenicectomy prior to thoracoplasty is rapidly gaining ground, and it is performed now by most thoracic surgeons routinely from one to two months in advance of the collapsing operations. I have used it in all cases. It acts as a partial test of the opposite lung, particularly when there are any areas of which one may be suspicious. The squeezing of toxins into the circulation, and possibly some increased respiratory activity on the other side may cause the lighting up of areas which are doubtful, or not even suspected of activity.

In addition, it increases the effect of the thoracoplasty, and in cases of displacement of the heart, mediastinum or trachea by scar tissue, it tends to relieve the traction. It is of value at times in improving the condition of a patient not quite equal to collapsing operations, and they may be performed later without undue risk. It decreases the number of ribs one must resect, so that as a rule the removal of the upper nine, and in some instances of strictly apical disease the upper seven will prove sufficient. It may thus save an additional stage.

THORACOPLASTY

Patients who have complications contraindicating thoracoplasty, and in whom pneumothorax is not possible, may be considerably benefitted. It is at times worthy of trial in cases which are going down hill in spite of all medical measures, and may prove sufficient to alter the unfavorable progress, so that eventually thoracoplasty may be performed.

Thoracoplasty is the substitute for pneumothorax in those cases where adhesions make the latter unsatisfactory or impossible. Various attempts at small resections were carried out but proved useless, and no progress was made until Brauer in 1907 induced Friedrich to take out the entire ribs from the second to the tenth. The results were often good, but the mortality was almost prohibitive. Sauerbruch and Wilms later modified the procedure to include only the posterior portion of the ribs close to the spine, and to carry this out in more than one stage. The compression was found to be generally satisfactory and sufficient, and this is the procedure commonly used at present.

There are some points here worthy of attention. For satisfactory collapse of the chest wall it is necessary that the ribs be cut close to their junction with the spine, and it is vital, particularly in the ordinary case with disease in the upper lung, that the first rib be sectioned with the rest. Otherwise the bony frame-work is more or less supported and not enabled to fall down and in.

One must consider each case individually, to accomplish the best results. Some will require the removal of only short pieces of the lower ribs, while in others the customary removal of a few centimeters of the upper ribs will be insufficient to satisfactorily compress the apex, especially if there are large cavities.

In some of these cases it is advisable to remove additional lengths in front or, as Hedblom and others recommend, the entire rib. This should be done within as short a period of time as the patient's condition warrants, as, if one waits too long between steps or to see what the previous resections will accomplish, the later operations will not give nearly such good results, and are often more difficult.

Large cavities in the apex are especially difficult to compress, particularly if thick walled, and even the most radical removal of ribs may bring about only a partial result. In these instances, if the sputum is considerable and the symptoms indicate it, an apicolysis will have to be attempted. The results reported from this procedure are not so satisfactory as one might think, and it should be used chiefly where other means are not equal to accomplishment of their purpose.

The performance of thoracoplasty in stages is essential to the safety of the patient. The one stage operation is no longer being done. Three, four or even more steps are entirely consistent with the achievement of the desired result, and often are the means of bringing through a case which would not otherwise survive.

I believe that thoracoplasty should as a rule be done from above downwards, and preceded by phrenicectomy, especially in the presence of a large amount of sputum or of good-sized upper lobe cavities. One of the principal causes of death after collapse operations is tuberculous pneumonia in either lung, due in large measure to the lack of expectoration in the days immediately following. The raising of sputum is accomplished chiefly by the lower chest and abdominal muscles, and, where this power has been impaired through previous surgery to the lower ribs, there is an increased liability to that complication. The ordinary objection is that the lower lung should be compressed first, so that fresh infection may not take place, but the paralysis of the diaphragm has already in large measure accomplished this.

The indications for thoracoplasty are primarily those which one might expect but with certain reservations. Where pneumothorax can not be used because of adhesions, or in those instances in which compression is incomplete, we have a means of doing what otherwise would be impossible. When effusion is present after pneumothorax and empyema threatens, it may prevent long disability and save life. The occasional patient, who will not or can not have refills of air, is suitable for thoracoplasty, as is also the case in which artificial pneumothorax and phrenicectomy are insufficient to control repeated hemorrhage.

It should be confined, however, almost entirely to those patients in whom the disease is essentially unilateral, and where the opposite lung is either apparently free from infection or where the disease has become improved and arrested through continued medical management. The fibrotic type with or without cavities is particularly suitable, while the pneumonic form is unfavorable. The case should be in reasonably good general condition, and not one which is slipping fast in spite of all the ordinary measures.

It is here that great harm can be done. It may be the last hope for the patient. He and his family may understand it, but others in the community do not, and this applies especially to those who themselves have the disease, and are or would be suitable cases for operation. Surgery comes into disrepute and is refused by those who should have it. In addition, the results in accepting these cases which are so far gone are bad enough to make the thing prohibitive in itself.

TREATMENT OF SALPINGITIS*

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Time was when the enthusiastic surgeon treated all forms of salpingitis by removal of the fallopian tubes. The question whether the condition was acute or chronic was not considered of great importance. The causative agent was not carefully considered. The gathering of data and increase of knowledge have persuaded the best gynecologists that this is the chief pelvic infection, wherein conservation is a virtue, and this conservatism in the last generation has made cures nine times as frequent as of yore.

Before enterng into the treatment of salpingitis it is well to discuss the common types of infection, their avenues of approach, and the location of the various lesions. Practically all salpingitis of an infectious nature is due to the gonococcus, the streptococcus or the tubercle bacillus. The two former cause acute salpingitis. Tuberculous salpingitis is chronic.

The causative organism is difficult to isolate in many cases. If a history of gonorrhea can be obtained and positive smears can be made from the vulva or cervix, the diagnosis of gonococcal infection is quite certain. The streptococcus is not so easily isolated, but here again the history is of marked assistance because a streptococcus infection is usually a sequel of abortion, or occurs in the puerperium.

The gonococcus travels up the cervix and along the endometrium to the fallopian tube. The streptococcus passes through the periuterine lymphatics and veins to form a cellulitis in the connective tissue surrounding the uterus, and the salpingitis found is merely a concomitant of the more important pelvic peritonitis. Streptococcic infection of the tube usually is accompanied by an infected ovary and an abscess of both tube and ovary is frequent. It is likely to be unilateral. Generalized streptococcic peritonitis it almost always fatal. Streptococcic salpingitis may occur without upward spread from the cervix.

Danforth (*Surg., Gynecol. and Obstet.,* March 1917) quotes a case seen in the clinic of J. C. Webster, in whom an anatomic malformation occluded the cervix so there was no connection between vagina and endometrium. This patient had a streptococcic salpingitis. Danforth also reports an interesting case of his own, where a streptococcic infection arose in teeth and tonsils and produced a streptococcic salpingitis.

An article by Clarke and Norris (*Surg., Gynecol. and Obstet.,* July 1917) states that, when the gonococcus once invades the fallopian tubes, it will always be found there. Clarke doubtless changed his belief before his death. The same article describes the then routine treatment of acute salpingitis as follows: "The patient is kept in bed until the acute process subsides and the mass decreases in size or becomes less hyperesthetic. The temperature must fall to within one degree of normal and must remain there for at least three to five days before we consider the time for surgical intervention opportune."

This was written ten years ago. Authorities now agree that operation would best be postponed for several months, and then be omitted entirely unless there be distressing symptoms such as recurrent attacks or adhesions.

Observe the different advice nine years later by Stevens, of St. Mary's Hospital, in the *London Lancet,* January 23 and 30, 1926. He says: "The gonococcus lives in the inside of the tube but a short time, not more than two weeks after fever and tenderness have subsided. Flare-ups are more likely a misnomer. The case is a reinfection from below, due to douches carrying infection from below or to fresh infection. Operation on fallopian tubes for eradication of gonorrheal infection is not often indicated."

In streptococcic infection "six months is surely the minimum length of time to allow for subsidence of infection. If possible, operation should be postponed for two years or more."

Tuberculous salpingitis, in contradistinction from gonococcus or streptococcus infection, is a chronic disease. The best authorities recommend prompt removal of tuberculous tubes. The diagnosis of this condition is made by clinical evidence of tuberculosis of the lungs or other organs, loss of weight, 4 p. m. rise of temperature, and possibly at times by the tuberculin test.

Much responsibility rests with the surgeon in his efforts to differentiate acute appendicitis and acute salpingitis, especially right sided salpingitis. One diagnostic sign is tenderness of the uterus and pain on pushing the uterus by the cervix in the case of salpingitis. It must not be forgotten, however, that at times a low appendix may be in contact with the right tube and both be inflamed.

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* Read before King County Medical Society, Seattle, Wash., Nov. 21, 1927.

According to Curtis (*Surg., Gynecol. and Obstet.,* Jan. 1926) 30 per cent of purulent leucorrhea contains virulent streptococci. Laboratory investigations by him on specimens of uteri secured by hysterectomies showed there is practically never an infection of the fundus uteri. The abortionist who performs one intrauterine instrumental operation is not likely to produce an infected uterus, but where two or more curettings are performed there is a great probability of producing endometritis and parametritis (or cellulitis).

The treatment of acute salpingitis, therefore, is palliative. The best authorities recommend rest, elimination and the encouragement of absorption of the products of inflammation. These measures are accomplished by confining the patient to bed, applying heat (in a few cases cold) to the abdomen, the administration of hot vaginal douches every few hours, and mild laxatives if needed, or enemas if preferred.

Stevens recommends the above treatment and later on the vaginal application of such substances which have affinity for water and set up a discharge from the cervix. He says that glycerin and ichthyol are the only remedies which fulfill this requirement and recommends 10 per cent ichthyol tampons or suppositories every other night, preceded by a hot douche and, of course, the use of douches between these treatments. He claims that a more frequent administration of ichthyol is irritating.

As to the dangers of nonoperative procedure in connection with the possibility of intrauterine rupture of a pus tube, Stevens says: "Intraperitoneal rupture of a chronic pyosalpinx is an exceedingly rare accident and its possibility may properly be disregarded." In the same article he says: "The sooner a tuberculous tube is removed, the better for the patient."

Someone may ask why the acutely infected fallopian tube should not be operated on and why the pathology of this organ is not analogous to the pathology of an acutely inflamed appendix. The answer is three-sided.

First. The appendix is not an essential organ and the average woman is better satisfied with life, if she knows she has at least a remote chance of conceiving, and conception has occurred in women who have had double gonorrheal salpingitis. In *Surg., Gynecol. and Obstet.,* Jan. 1926, in an article by Curtis, on "Chronic Pelvic Infections," he has a picture of a healthy woman and her child with this subscription: "Mother and son, a demonstration of the value of conservative treatment. This woman had an acute salpingitis after marriage and was treated conservatively. Operation was performed four years later for relief of pelvic adhesions and sterility. Left hydrosalpinx was removed; the adherent right tube was released, the fimbriae opened and air forced through the lumen of the tube into the uterine cavity. Pregnancy occurred within five months. A second baby is expected soon."

Second. The acute pyosalpinx contains active gonococci or streptococci which nature will practically always kill in a few weeks in the former, and often kills in a few months in the latter case. Nature is building a barrier in the pelvis and is throwing out adhesions which confine the infection to the pelvis.

Third. In addition to this, the patient is becoming immune to the infection, and until this immunity has occurred, a laparotomy which is bound to break up the adhesions and open new channels of infection may prove disastrous.

Where, however, the abscess is causing marked constitutional symptoms and where a mass can be felt bulging into the vagina, it may be a wise procedure to establish vaginal drainage. In this procedure care must be taken not to puncture the uterus or rectum, and the ureters must be avoided. Rubber tubing gives the best drainage and some self-retaining device is advisable. Gauze may be packed alongside the rubber tube if desired. Irrigation of the abscess cavity should never be done on account of the danger of breaking through nature's protective barrier above, thus causing general peritonitis. In case the abscess is in the broad ligament, extraperitoneal opening may be made by going in above one or both Poupart's ligaments.

The intramuscular administration of some foreign protein has been successfully employed. The favorite form at present is milk sterilized or pasteurized or given raw.

CASE REPORTS

Case 1. This illustrates an exception to the rule that we do not get an intraperitoneal rupture of a pus tube. This patient was admitted to Seattle General Hospital July 26, 1926. She had had an abortion performed two weeks previously. Three days later another curettement was done in the doctor's office and three days later an intrauterine douche was administered. After this she developed fever and headache with pain and tenderness in right lower quadrant of the abdomen.

Physical examination revealed a mass behind and to the right of the uterus. Her temperature was running about 102°, pulse 100; leucocytes 13,400; polys 84 per cent.

Puncture of the mass per vaginam was considered but postponed until further heading up toward the vagina could be detected. Hot douches and hot packs were administered. On July 30, four days after admission to the hospital, her temperature went to 103.5° and she was seized with severe abdominal pain. The mass behind the cervix could no longer be felt and her abdomen was rigid. A diagnosis of ruptured pus tube was made, and on operating free pus was found in all parts of the abdomen. The smears and cultures from this pus showed staphylococci.

After draining for a few weeks and weathering the storm of a pneumonia and what appeared to be an interlobar empyema followed by lung abscess, the patient made a recovery.

This case is mentioned because it illustrates how easily an infection can be stirred up in the uterus from repeated intrauterine manipulations. If the tuboovarian abscess which ruptured was of some months or years standing, new and fresh organisms produced an acute attack. The postoperative prognosis of this case was bad. The chief reason for calling it to your attention is that rupture of a pus tube is rare.

Case 2. Patient, age 18, with normal menstrual history, never before pregnant, consulted me March 2, 1927. Her husband had had gonorrhea and was pronounced cured. She had never had positive slides. She was pregnant and had felt life in February. According to her history she was due July 22, 1927. She had foul watery discharge from uterus, no fever. Uterus size of five months pregnancy. Wassermann entirely negative. Diagnosis, dead fetus.

On Mar. 7 she had bearing down pains and went to the hospital. Rectal examination showed small parts well down and slight dilation of cervix. Next day she was prepared. A foot was found in vagina and a dead fetus was removed at 5 p. m.

The placenta did not come away. The cord was cut and patient was put back to bed. Crede manipulation later in the evening failed to express the placenta. On Mar. 9 her leucocytes were 25,800, polys 82 per cent, temperature normal. A little before noon the patient was taken to the surgery and given ether, under which the placenta was expressed by mild Crede, without any intravaginal or intrauterine manipulation. The patient made an easy recovery and never had fever.

On April 2 a smear from cervix was positive for gonorrhea. This may have been a reinfection. Since then she has received treatment for gonorrhea and endocervicitis. Her left fallopian tube soon thereafter was found enlarged and tender, but never exquisitely so, and she has not had constitutional symptoms.

This tubal infection illustrates the upward spread of infection following delivery or abortion, in spite of conservative, hands-off management of the delivery of her fetus and placenta.

Another interesting point is that the tube has by now returned to normal size and she appears to be cured. We must not forget, however, that this tube is subject to reinfection, and such should not be called a flare-up of the old condition.

Case 3. Patient is a well nourished young woman, age 18, suffering from acute pain and tenderness over both fallopian tubes, particularly the left. She entered the hospital with a history of backache of three years standing and irregular menstruation but no history of delivery or abortion. The abdominal pains became more severe three weeks before admission to the hospital.

Examination demonstrated a mass in the lower left quadrant with rigidity of the entire lower abdomen. There was no pointing to abscess in vagina. Her temperature ranged from 100° to 102.6°. Her pulse was rapid. Her leucocytes ranged from 12,000 on admission to 26,000 two days later. In spite of hot douches and external heat to the abdomen, she appeared to be getting worse.

With the vision of the previously mentioned case of ruptured pus tube before me and the high location of the mass precluding vaginal puncture, the abdomen was opened and extensive adhesions of chronic pus tubes to uterus and intestines on both sides were liberated. During the operation there was a liberation of some free thick creamy pus. The tubes were so necrotic that the tissues could not be tied off and a pack had to be left behind the uterus to control hemorrhage. Her temperature reached normal three days after the operation but came up to 100° several times during the week, finally reaching normal and remaining there.

Gram-negative diplococci were secured from the vulva before operation. Cultures from the abdominal pus showed no growth on bouillon. The patient appeared to be cured when she left the hospital.

The question arises whether this woman should have been operated on. Each method of treatment has its advocates. From the history this case was evidently a chronic gonorrheal salpingitis with a reinfection. Operation appeared to be called for because the case was daily getting more fever, more leucocytosis, and increasing tenderness and rigidity with no abscess pointing in the vagina. The operation seemed to be justified also because of the adhesions found and the necrosis and consequent friability of the fallopian tubes.

An effort was made to secure statistics of a few cases in Seattle. A review of the histories in the Seattle General Hospital for 1925 showed 44 cases of salpingitis. Of these 17 were acute, 25 were chronic. In 2 gonococci were found; in 42 no definite causative organism was proven present; 16 cases were one-sided; 26 were double; 2 uncertain. Eight had complications, such as fibroid uteri, recent abortion, cystic ovaries and malpositions of uterus. Twenty-seven had menstrual irregularity as a symptom; 38 had pain as a predominating symptom; 13 had nonoperative treatment; 30 had operation with removal of tube or tubes. One had curettement only. Six of the acute cases had laparotomies. These were all reported cured. The result of treatment at end of hospitalization is reported in the histories as giving 35 cured, 5 improved, 1 died (this case was complicated by a persistently bleeding fibroid), 3 improved.

SOME PROBLEMS IN PLASTIC SURGERY

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Case 1. A young girl, age 12, presented several hundred black, pigmented moles scattered over her body and one large, rough hairy mole, measuring seven by twelve inches, located in the small of the back, near the spine, with an open discharging surface one and one-half inches in diameter.

The three problems considered were, (1) Is the open surface a malignancy developing on this huge congenital mole? (2) The best method of removal, knife or endothermy. (3) Method and time of closing the large resulting defect.

In favor of malignancy, the open wound had been getting progressively larger for the past six weeks, in spite of usual care and protection, and the child's general health was below par. She could not gain weight. Against malignancy was the absence of bleeding, lack of characteristic hardness and absence of glands.

It was considered best to remove the growth with the endothermy knife which worked very satisfactorily, and extensive sliding skin flaps were made which nearly closed the opening. The wound, however, was infected and much of the work was undone. Several weeks later Tiersch grafts were taken from her body, after first cutting out the small moles present. Our grafts were, therefore, unusual, as they contained many moles. The Tiersch grafts were an entire success, the whole field taking together nicely, with the exception of some keloid formation at the margins of a few grafts, and some keloid spots which developed in the holes present in the grafts. Pathologic report of mole, no malignancy (figs. 1, 2, 3, 4).

An interesting side note is that the girl has grown four and one-half inches, and gained fourteen and one-half pounds in the six months following operation.

Case 2. A school teacher had applied cancer paste to her left nostril for a supposed cancer, and destroyed the greater part of the left ala (fig. 6), causing the tip of the nose to be drawn down one-quarter inch and one-quarter inch to the left of the midline. The left nostril was small and irregular, and the right nostril was almost closed, as its ala was drawn tight against the nasal septum, acting like a flap valve (fig. 5). The upper lip was drawn upward one-quarter inch on the left side, exposing the upper incisor teeth, and the vermillion border was drawn upward, much as one sees in harelip.

The probelm, therefore, was to overcome the deformity in the left ala, raise the tip of the nose one-quarter inch and move it one-quarter inch to the right, free the right nostril from its valve-like action and lower the left central part of the lip one-quarter inch.

The patient fortunately had a well developed cartilaginous spur on the right side of the septum, which can be seen in the photograph (fig. 5). Under rectal anesthesia, which I cannot recommend too highly in plastic work on the face, I made an incision along the mucocutaneous border of the left ala, carrying it down along the left border of the septum, forming a V at the junction of the upper lip and the nose. The incision was then carried up the right mucocutaneous border of the septum in the right side, to the upper edge of the right nostril.

A thin flap of skin was dropped down from the defective left ala, and the columella raised upward, stripping it free from the septum. The cartilaginous spur on the right side with its mucous membrane was cut free to its base, leaving the upper end attached. It was then free like a tongue, was carried across the septum and stitched to the under side of the thin skin flap of the left ala.

The upper lip was then freed from the maxilla and the V incision at the base of the columella converted into a line, thus forcing the upper lip downward one-quarter inch. The columella was then mounted on the base of the septal spur, which elevated and shifted the tip of the nose to its desired position, entirely overcoming the former parrot-beak appearance in profile. Splints were used in the nostril until healing was complete, and the patient is very pleased with the result (figs. 5, 6, 7, 8).

Both nostrils, you will note, are freely open. The nose is now in the midline. The lip has been lowered to its normal place, covering the upper incisor teeth, and the vermillion border has its normal easy curve.

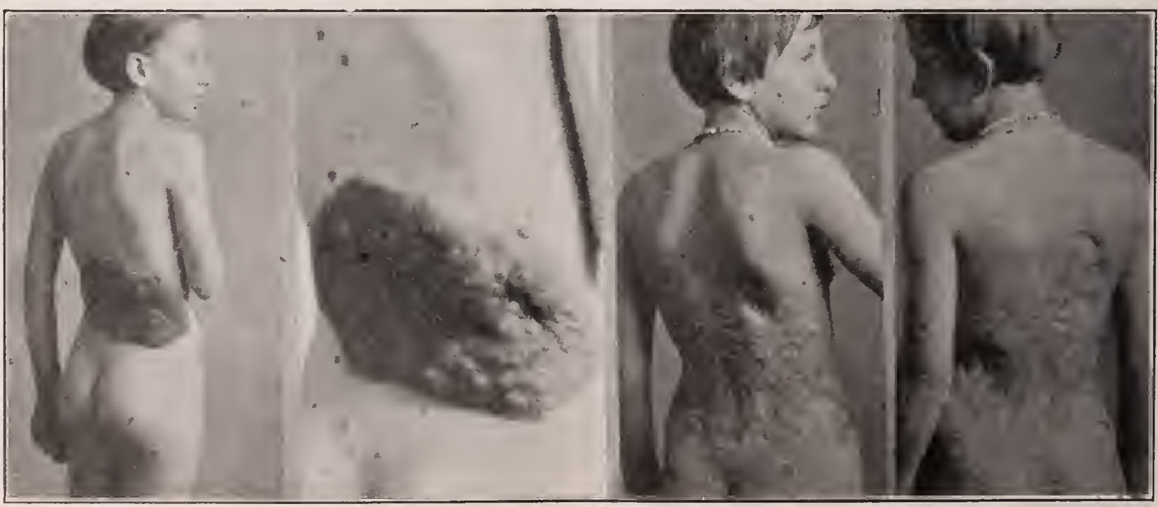

Fig. 1 Fig. 2 Fig. 3 Fig. 4

Case 1. Figs. 1 and 2 before operation. Figs. 3 and 4 show final result.

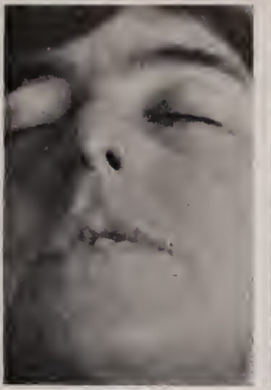
Fig 5

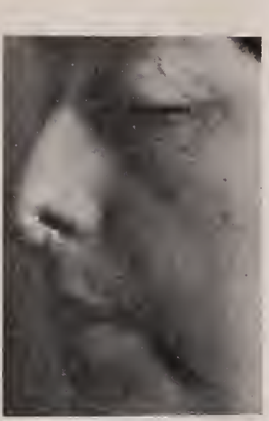
Fig 6

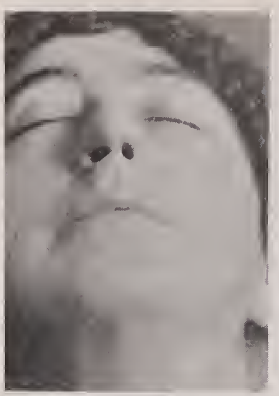
Fig.7

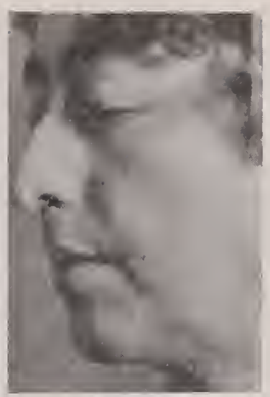
Fig. 8

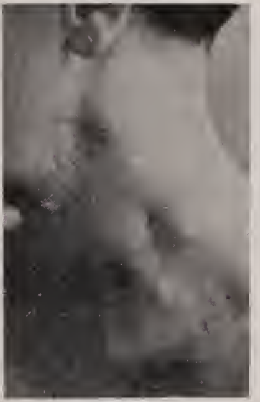
Fig 9

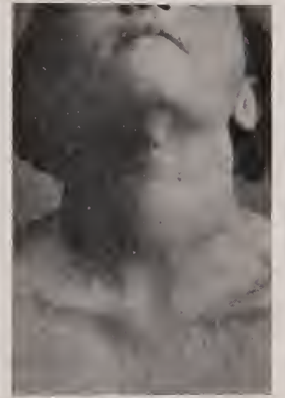
Fig.10

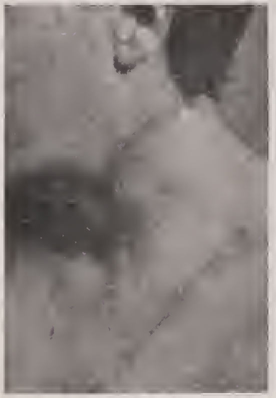
Fig.11

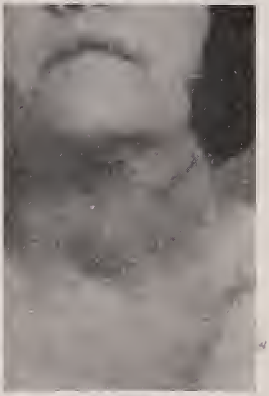
Fig.12

Case 2. Figs. 5 and 6 before operation. Figs. 7 and 8 show final result.

Case 3. Figs. 9 and 10 before operation. Figs. 11 and 12 show final result.

Case 3. A young woman had been terribly mutilated by poorly placed scars about the angle of the left jaw, the sides of her neck and down over the clavicles on her chest, said to have been done in Europe during her childhood on account of tuberculous glands. You will note the width of the scars are from three-eighths to one and a half inches, that there are numerous depressions in the neck and above the clavicles, and that she possessed a fair sized cystic goiter.

The old scars were carefully excised, care being taken to make clean, sharp edges. Her goiter was removed through the angular scar to the left of the midline and well above the usual location for a goiter operation. The depressed areas were filled with fat, all subcutaneous tissue was firmly united to form an adequate foundation for the skin, which was sutured subcutaneously with dermal (figs. 9, 10, 11, 12).

You will note that the scars are but lines. The photograph was made two weeks following operation, hence all reddened areas appear dark.

Case 4. An old man had a horn-like, epithelial growth, involving two-thirds of the lower eyelid, and causing ectropion on account of the weight of the tumor.

Under local anesthesia, the tumor was removed through an oval incision, and the surface covered by undermined sliding skin graft (figs. 13, 14).

You will note he has no ectropion and his eyelids function perfectly.

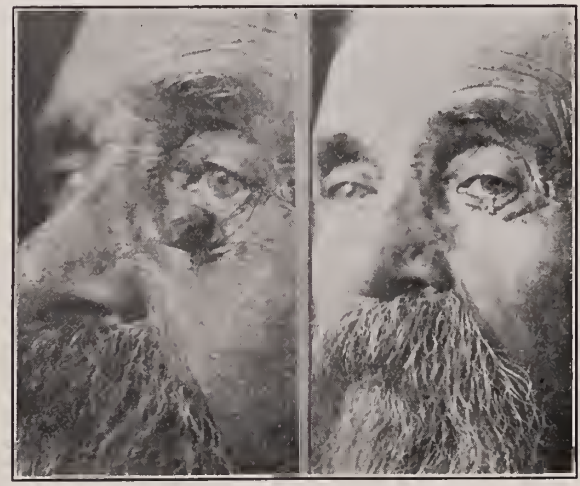
Fig. 13 Fig. 14

Case 4. Fig. 13 before and fig. 14 after operation.

Case 5. This was a recent cauliflower ear of the maximum degree, the cartilage in the helix having been extensively fractured. The perichondrium of the whole anterior surface of the ear had been stripped from its bed, and the underlying surface filled with a huge hematoma, which had destroyed every semblance of an ear.

Under local anesthesia the cavity containing the hematoma was opened, the fluid extracted by negative pressure, the cartilage made smooth with a curette and freed from blood clot, the perichondrium

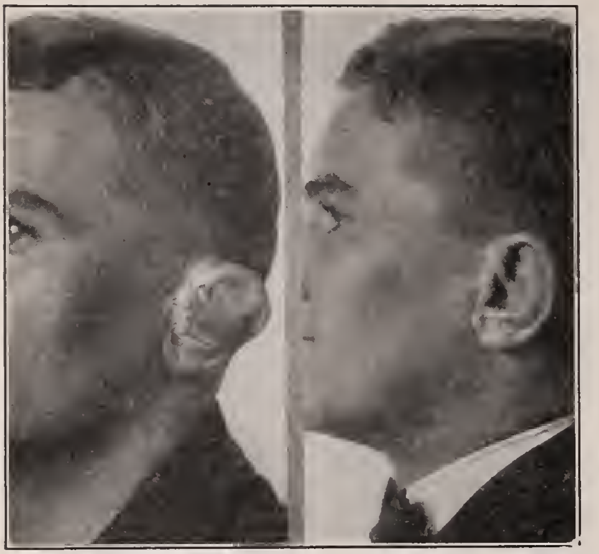

Fig. 15 Fig. 16
Case 5. Fig. 15 before and fig. 16 after operation.

replaced and held in position by negative pressure. A plaster of paris mould completely encased the ear, by the method formerly published (figs. 15, 16).

Ten days later the cast was removed, and figure shows the finished ear.

Case 6. This patient had a large vesicovaginal fistula, readily admitting three fingers, following a vaginal cesarean operation done elsewhere. This young woman was 23 years old, and had had five operative attempts for closure made before I saw her.

She was sent to Drs. Jones and Peacock for cystoscopic examination, to determine if possible whether the internal sphincter was cut. It certainly was, the opening extending through the trigone and three-fourths inch down the urethra.

Under ether anesthesia and with the able assistance of Dr. Peacock, the bladder was separated from the vagina for at least one-half inch and the ureters were exposed. The internal orifice of the left ureter was plainly seen by the indigo-carmin previously given. The right was not identified.

A suprapubic opening was then made and the raw surfaces of the bladder walls were approximated by interrupted mattress sutures, causing an ectropion of the bladder wall, much like a septum. A retention catheter was placed in the urethra and large suprapubic drain in the bladder, a silk suture being tied to the inner end of the urethral catheter and brought out through the suprapubic drain for its subsequent easy removal.

We then went below, reconstructed the urethra and cut-off muscle, and sutured the raw surface of the vaginal wall with mattress sutures, the ridge formed projecting into the vagina much like a septum, but in the opposite direction from the bladder flap. Thus we had created one inch of raw surface at the site of the vesicovaginal opening.

Eighteen days following operation she had retention, and by placing her in a hot bath she voided. Twenty-one days after operation she was discharged from the hospital, with no leakage into the vagina and having control of the internal sphincter.

She was given instructions to void every two hours to favor complete closure of the suprapubic wound, which is but pin-hole size. May 1 she was normal, with the wound entirely closed.

GENERAL UROLOGIC DIAGNOSIS *

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Some urologic diseases are easily overlooked and erroneously diagnosed. The internest and surgeon now scrutinize the urinary tract more than ever, particularly where there is lateral abdominal pain. Differential diagnosis of abdominal and pelvic pathology must take into consideration the kidney, ureter and bladder. Negative findings are often just as valuable as positive ones. The clearest means of illustrating the workings of urologic diagnoses is to describe a few of the commoner diseases through terms of symptoms.

Primary renal tumors develop slowly and without pain. Usually the first symptom is a tumor in the lateral border of the abdomen, extending into the costovertebral angle of the back. These tumors are usually hard, smooth, regular in outline and not tender. There may be a dull ache or sense of weight. The patient is afebrile. Usually the blood picture demonstrates a secondary anemia. There may be some loss in weight, although this is not the rule. The urinalysis is often normal or there may be present few to many red blood cells. Pyelograms as a rule demonstrate compression of the calices and a tumefaction of the kidney. They are most valuable here.

On the left side, tumors of the kidney are confused with enlargement of the spleen. The splenic tumors can be diagnosed by a left pyelogram. The straight course of the ureter is preserved and a normal filling of calices and pelvis is seen. A barium enema is often of value in outlining tumors of the left upper abdomen.

Polycystic kidneys are not uncommon. The family history is usually made up of many deaths from kidney disease. It is a family heritage. The symptoms are those of a chronic interstitial nephritis, namely, low specific gravity, trace of albumin, low kidney function, polyuria, increased blood content, and usually well developed bilateral kidney tumors. The lobulations are easily felt. Pyelograms show large crescent shaped masses, due to partly filled cystic cavities. Many of these kidneys have been removed; this usually results in death from renal failure.

Right pyelonephritis has innocently been responsible for many appendectomies. A rise in temperature, marked leucocytosis and severe pain in the right abdomen, occasionally with right rectus spasm,

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* Read before Snohomish County Medical Society, Everett, Wash., Oct. 18, 1927.

are frequently seen in a right pyelitis. In all such cases a bacteriologic examination of the urine should be made and, if pyuria exists, a renal study is indicated if for no other purpose than exclusion of renal pathology.

Renal tuberculosis has a most insidious onset. There are few subjective or objective symptoms until the disease is well advanced. For a long time there is increased frequency of urination without discomfort. The general health is apparently good. Later there is terminal burning and moderate hematuria. Even with renal suppuration there is usually an absence of backache. If the ureter becomes occluded with pus or clots, colic can occur which resembles the passing of a calculus. If there is any rise in temperature, it is usually slight.

A marked pyuria is the rule. The microscopic field will be filled with well formed pus cells and no bacteria are observed. Repeated searching and pig inoculations often demonstrate the tubercle bacillus. Renal study usually clears up the diagnosis. The bladder may contain tubercles, pearly or ulcerated. The orifice of the involved ureter and kidney may show edema, ulceration or stricture.

Pyeloureterograms have marked changes, as dilated or ragged ureteral outlines, dilated irregular calices or tuberculosis cavities. It is possible to make a very accurate diagnosis from the pyelograms, to say nothing of the urinalyses of the separate kidneys. Delayed, impaired or absent function occurs. Tuberculosis, calcification and autonephrectomy can be diagnosed.

Where the suppuration has become perinephritic, the contrast solution can be demonstrated extrarenally. One such case was admitted with a working diagnosis of pleurisy with effusion. There was a secondary involvement of the lung from a large subphrenic abscess. Nephrectomy cleared up the pulmonary symptoms.

Tuberculosis of the epididymis is often very acute, resembling the epididymitis of gonococcal infections. Fever, acute swelling in forty-eight hours, tenderness and local heat simulate the commoner infection. The diagnosis is made by urinalysis, examination of the prostate and vesicles, and an examination of the upper urinary tract.

Malignant tumors of the testicle are also acute at times. They are usually hard, and have less involvement of the vas deferens. Often the correct diagnosis cannot be made without the aid of the microscope. In the absence of venereal infection it is wise to bear in mind the possibilities of tumor or tuberculosis.

The differential diagnosis of perinephritic abscess is interesting in the extreme. In rapid suppuration the pus breaks through the perirenal fascia. Various courses are followed, as under the skin in the lumbar triangle, along the psoas muscle into the groin, perforation into the subdiaphragmatic space, into the pleura or the intestines. In many cases of perinephritic abscess the infection comes from other foci, as the intestines, bone disease, gallbladder, while the kidney itself is not involved. Hence, pyelograms and renal study are negative in their findings. This misleads some in making a diagnosis.

The cardinal symptoms are severe, constant, unilateral pain in the back, usually over the second to the fourth lumbar vertebrae. This pain may travel down the psoas muscle and affect the thigh. The presence of an abscess causes a local tumefaction, heat, redness, spasm and rigidity of the lumbar muscles, fixation of the vertebrae at this level, and retraction of the thigh due to psoas irritation. The temperature rises three or four degrees and the leucocyte count is well above 15,000.

The differential diagnosis lies chiefly between a retrocecal appendix and a pyonephrosis. The rigidity of the spine and the absence of tenderness over McBurney's point favor perinephritic abscess. A suppurative pyonephrosis can be diagnosed by pyelograms and separate kidney urinalysis.

Urolithiasis has been frequently missed. The symptoms of this disease vary greatly. The silent calculus, with a cortical or calycal location, where it does not move, or a large impacted, well grooved ureteral stone not infrequently are devoid of all sharp pain. A dull ache may be brought on by unusual or excessive exercise. Outside of this, the patient may suffer but little. There may be mild gastric or cardiorenal symptoms which absorb the examiner's attention. The lumbar backache is quite secondary. Even a urinalysis may fail to show red blood cells, pus or bacteria. When the examination has failed to explain the symptoms, a roentgenogram clearly showing the kidney outlines should be made. If the film is poor, too dense or the bowels filled with gas, retake it until it is satisfactory. A poor roentgenogram gives misleading and inaccurate information and is worse than none at all.

Calculi of the renal pelvis and ureter are more apt to give colic which radiates into the groin, thigh and external genitals. If infection is absent, there is apt to be a normal temperature. If infection is present and a block of the ureter occurs, the temperature will rise four or five degrees. The urinalysis demonstrates red blood cells, pus cells and bacteria. The presence of staphylococci in the urine associated with renal colic is most suspicious of calculus.

When these attacks of colic are right-sided, they greatly resemble an acute appendicitis. A surgeon of lesser experience, called in the middle of the night, without the aid of laboratory or consultation, feels the responsibility of missing a rapidly suppurating appendix. Hence many an appendectomy has been done when the pathology was in the right ureter.

The bedside differential diagnosis is not always easy. In appendicitis there is usually the history of not feeling well for the past few days and a lessening of the bowel action. The pains come on at intervals with increased severity. The pain at first is all over the abdomen; then a tenderness is located over McBurney's point. Rigidity and spasm of the right rectus occurs. The temperature rises slightly but the pulse is higher. The easing of the pain by flexing the right leg is a classic symptom.

In right ureteral calculus the pain comes on suddenly without previous warning unless marked infection is present. While there may be general abdominal pain, it is not the rule. It is usually located laterally. The pain may all be in the costovertebral angle or follow the course of the ureter. The attack of pain is more severe than appendicitis, of a continuous character, and only relieved by large doses of opium or its derivatives. Tenderness is noted over the kidney and only slight pain over the ureter. Pain is due to an obstructed ureter, with peristaltic movements endeavoring to force the urine downward. In appendicitis there is an acute inflammation with a localized irritation of the peritoneum. Spasm and rigidity of the right rectus are usually absent in ureterolithiasis. The flexion of the right thigh is also absent. Ureteral colic is usually so severe that pallor, sweating, a doubling up of the legs and collapse are noted. In addition, the pain frequently radiates into the genitals of the affected side or thigh.

A microscopic inspection of the urine may show turbidity or the presence of blood. Murphy's percussion sign is usually positive, as the pelvis and calices are greatly distended, making the kidney very tender. When the patient is removed to the hospital the diagnosis is relatively easy with roentgenograms, cystoscopy, noting the appearance of the ureteral orifices and their function, obstruction of the ureter if present, uretograms and pyelograms.

ATRESIA OF THE VAS DEFERENS

REPORT OF A CASE

Herbert E. Coe, M.D., F.A.C.S.
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The incidence of congenital atresia of various organs or other portions of the body is not rare. Congenital atresia of the vas deferens, however, has not previously come to the attention of the writer, either in the literature or in personal experience. The following case bears out the frequent observation that congenital deformities are often multiple, the atresia of the vas being associated with double undescended testicle and with a congenital defect of the superior maxilla.

The fact that secondary sex characteristics had not developed in this boy also brings up the question of the relationship between sterility, sex characteristics and ectopic testes. It is generally accepted that the frequently noted sterility of ectopic testes is due to the abnormal location. This case, however, suggests an additional cause for the sterility and affords an explanation other than trauma for the fact that scrotal implantation of an ectopic testis does not always correct sterility. In this connection the presence of atresia must, of course, be demonstrated before the effect of trauma may be disregarded.

The patient came for examination on account of double undescended testicle, being worried by the fact that, although he was nearly nineteen years old, he still seemed physically immature and unlike other boys of his age.

Family history and past history present nothing of interest. Normal mentality, but on account of his facial defect he has always been rather sensitive and restricted in his social contacts. He has noticed the genital abnormality but paid no attention to it until the past year, when he has begun to be more attracted by the opposite sex.

Physical examination shows a well developed and well nourished boy, normal except as follows: Puerile voice; soft delicate texture of skin; absence of hair on the face, axillae and pubis; congenital defect of nose and superior maxilla; penis small but normally formed; scrotum retracted; right testis lying in the external ring; left testis high in the inguinal canal; both testes movable, not tender, undeveloped. Genitals in general have the appearance of those of a boy three or four years old.

It was decided to bring the right testicle into the scrotum with the hope that the normal position would induce the development of secondary sex characteristics.

Operation. Incision over the right inguinal canal showed that the testicle with its normal coverings had folded upward and was lying just inside the canal. The testicle was very small, the cord apparently normal, and a small hernial sac was present. The cord was dissected free from the sac and the latter removed. The delicate fibrous bands in the cord and those holding the testicle in its abnormal position were very carefully freed without injuring the blood supply. When this had been accomplished the testicle remained well below the level of the pubis without tension.

Finally, during the examination of the vas to make sure of its blood supply and integrity, it seemed to disappear near the testicle. Careful dissection showed it to be normal in the canal, but about 1½ c.m. from the testicle it became gradually smaller and markedly tortuous. When straightened out it was seen to become thread-like and finally terminate in a blind end. The testicle was fixed to the bottom of the scrotum with the hope that the internal secretion might still develop. The wound was closed in layers.

The postoperative recovery was uneventful, but at present, nearly a year later, the secondary sex characteristics remain as before. It seems probable that a similar condition exists on the opposite side but the boy does not wish to undergo another operation to verify it.

UNILATERAL URETERORECTONEOSTOMY

A REPORT OF TWO CASES[*]

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The transplantation of the ureters into the bowel is an operation whose applicability is becoming greater by reason of improvements in technic which lessen its inherent dangers. Employed at first chiefly in exstrophy of the bladder, it is now resorted to under certain circumstances in the management of such diverse conditions as carcinoma of the bladder, bilateral renal tuberculosis with severe vesical tuberculosis, intractable, simple ulcers of the bladder, accidental injury or resection of the lower ureter with subsequent fistula, etc.

The following cases are reported because they present features of special interest and because the end-results justified the procedure. There are no reported cases of unilateral transplants except as one step of the double operation or where there has been a single kidney. Case 1 is unique in that one ureter was transplanted into the bowel in an effort to save a kidney, when the opposite one was healthy and functioning normally. Nephrectomy is usually the procedure under these conditions but circumstances as noted in the report made this variation necessary. Its successful outcome warrants the consideration of ureteral transplant to the bowel as a means of renal conservation in certain cases of low, complete ureteral block, especially in early carcinoma of the bladder. Case 2 hardly comes under the category of a unilateral transplant, since there was but one kidney and the problem was that of a diversion of the total urinary output to the bowel. However, the indications were unusual and it is reported here for that reason.

Case 1. Female, age 38, married. First consultation October, 1925.

Chief complaint. Hematuria and burning on urination.

Past history. Of no importance in relation to present illness.

Present illness. One year ago patient had difficulty in urinating at times. Thought something was obstructing the neck of the bladder. This difficulty was relieved by lying down and voiding in the dorsal position. She was cystoscoped by her doctor who found a large papillomatous mass near left ureteral orifice, also numerous smaller papillomata throughout the left half of the basal zone. These were fulgurated on three different occasions. There were no further symptoms until one month ago, when there was some dysuria and hematuria. Reexamination showed an ulcer with a large slough in the basal zone of bladder. Patient was referred with a presumptive diagnosis of carcinoma.

Examination. General physical examination essentially negative. Abdominal palpation showed no abnormalities. The external genitals were normal. An infiltration in the base of the bladder could be palpated through vagina. Catheterized specimen of urine showed albumin + +, pus and red blood cells, massive and many B coli. The combined phthalein for two hours was, first hour 45 per cent, second hour 30 per cent. Plain x-ray picture of the kidneys, ureters and bladder showed nothing abnormal.

Cystoscopy. Large infiltrating, ulcerating carcinoma of the base, involving trigon and encroaching on the left ureteral orifice. The right margin is just under the right ureteral opening.

Treatment and progress. Because of the character and location of the tumor a resection was impossible, so it was fulgurated.

December, 1925. Cystoscopic electrocoagulation and implantation of seven bare glass tubes, containing 1.5 milecuries each of radium emanations. Screened radium was placed through cystoscope on the surface of growth for 1400 milligram hours.

Two months later the patient complained of loss of weight, anorexia, fever, sweats and a severe, dull ache in her left lumbar region. Examination showed that these symptoms were caused by a complete block of the left ureterovesical opening, either by invasion of tumor or by fibrosis following the radiation.

The question of the best management then arose. Some effort had to be made to save the left kidney. Because of the nearness of the carcinoma to the right ureteral orifice, which might be obstructed at any time, a left nephrectomy was out of the question. There remained to be done either a transplant of the left ureter into the bladder, a permanent nephrostomy or a transplant of the ureter into the bowel. It is poor surgery to transplant a ureter into a carcinomatous bladder, especially when the growth is not controlled. A permanent nephrostomy is a source of much discomfort. There is no continence and some device for catching the urine has to be worn. Besides, if a transplant into the bowel is unsuccessful, a nephrostomy can then be done. So the third procedure was adopted and the left ureter transplanted into the rectum.

February, 1926. Ureterorectoneostomy. It was impossible to do a submucous implantation after the Coffey method because of the inflammatory infiltration and thickening of the ureteral wall. However, it was fixed into the bowel after a small rubber tube had been placed through the ureter to the kidney and out through the rectum. Despite the marked infiltration of the ureter, which is presumably a contraindication to the operation, the transplant held.

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[*] Read before a Meeting of Western Branch, American Urological Association, Seattle, July 6, 1927.

Three months later the lumbar pain and tenderness had disappeared, the patient was in good health and had gained in weight. Rectal urination took place about every three hours. The left kidney had regained its function so that its urine collected by rectum gave a 30 per cent phthalein in two hours.

On cystoscopy it was found that the carcinoma had disappeared from the left half of the bladder, but had extended somewhat to the right and encroached on the right ureteral orifice. Since the left kidney was in reserve with enough function to tide over any temporary obstruction to the right ureter, we were now able to open the bladder, turn back and thoroughly radiate the remainder of the growth.

July, 1926. Suprapubic cystotomy, open electrocoagulation and implantation of radium, thorough fulguration of base and margins of growth and implantation of six needles, ten milecuries each of radium element (300 milligram hours).

The convalescence from this operation was uneventful.

The patient has been cystoscoped at three month intervals during the last year and a half. At the last examination there was no evidence of carcinoma in the bladder. There is a smooth scar replacing most of the base. The radium reaction has disappeared. Despite this scarring there is practically no dysuria. The patient has gained weight, is in excellent health and has no inconvenience from her rectal urination which takes place every three hours. The left kidney is maintaining its function, as evidenced by a 25 per cent phthalein output per rectum in two hours.

Case 2. Mrs. M. B., age 39, married. First consultation September, 1925.

Chief complaints. Increased frequency of urination and suprapubic pain.

Present illness. At the age of 18, following an infected vaccination, patient developed frequency and burning on urination. A diagnosis of renal tuberculosis was made. The dysuria was not relieved by various local and general treatments, a ureteral catheter was broken off and left in the left ureter. Nine months later it was passed through the urethra. The patient has had constant bladder distress and dysuria ever since. One year ago the appendix and a fibroid uterus were removed. Eight months ago a partial resection of the bladder was done for ulcer. At the present time she urinates every forty minutes at night.

Examination. Essentially negative except for the findings in the urinary tract. There was a chronic, generalized cystitis with ulceration in the middle and fundal zones. The bladder was contracted. Capacity 90 c.c. There was a bilateral pyelonephritis with ureterectasis and pyelectasis on the left. The function of the left kidney was one-half that of the right. B. coli in large number were found in the bladder and kidney urines. No tubercle bacilli were found at any time and guinea pig inoculations were negative.

Diagnosis. Left pyonephrosis, secondary ulcers of bladder (simple), contracted bladder.

Treatment and progress. The patient had numerous treatments extending over a period of two years, including frequent renal lavage and six cystoscopic fulgurations of the bladder ulcers. For varying periods, following the fulgurations, there would be decided improvement in the dysuria, the intervals between urination increasing at times to two hours. The ulceration would return, however, and the pain and dysuria became severe. A nephrectomy was done in the hope that removal of the badly infected left kidney would diminish the bladder infection.

There was decided improvement for a few months and then the dysuria returned and vesical tenesmus became almost constant. There was also excruciating pains in the lumbosacral region. From the repeated fulgurations the bladder had contracted, thinned out and there was evidence of a pericystitis.

The possibility of diverting the urinary stream was explained to the patient, together with the doubtful outcome because of the numerous abdominal and pelvic operations and because of the definite pyelonephritis in the remaining kidney. In spite of poor prognosis operation was accepted in preference to the intolerable condition which existed.

January 19, 1928. Transplantation of right ureter into lower sigmoid. Mobilization of both ureter and sigmoid extremely difficult because of dense pelvic adhesions. Impossible to do a submucous transplant because of shortness of ureter. A 12 F. soft rubber tubing used in ureter. This was attached to 12 F. silk woven ureteral catheter to give firmness at point of implantation.

Coffey in his last article on ureteral transplant recommends a silk-woven ureteral catheter instead of soft rubber to allow firm tying of end of the ureter to the tube to permit cutting through, so the catheter can be removed in ten days. The shellac coating of a simple silk-woven ureteral catheter is apt to disintegrate in this time and cause irritation, so the variation noted above was used, that is, a soft tube in the ureter was attached to stiff ureteral catheter at point of implantation which leads out of the rectum into drainage bottle.

Convalescence was normal for ten days after removal of ureteral tube. The urine drained through the rectum for several days. A fecal fistula then developed. This closed in three weeks and the patient was discharged from the hospital in good condition. On last report there is rectal discharge of urine about three times a day. All the bladder pain has disappeared. There have been several attacks of fever and chills with nausea and vomiting, evidently a recurrent pyelonephritis.

COMMENTS

The points for emphasis in connection with case 1 are that in carcinoma of the bladder death is usually the result of renal insufficiency from obstruction or infection, generally both. This is especially true, when the growth is in the basal zone and involves the trigon. The infiltrating, ulcerating carcinomas in this area are unsuitable for resection and must be treated by radium and electrocoagulation. In the course of this treatment, if a ureteral orifice becomes completely obstructed, we have in ureteroenterostomy a method for renal conservation. If it is successful, one kidney is out of the field and in reserve and a more vigorous attack on the carcinoma is possible, either by radium and coagulation or by a transplant of the other ureter later and a total cystectomy, if necessary. Case 2 illustrates a method of relief in intractable infections and ulcerations of the bladder, when all other methods have failed.

TRANSPLANTATION OF THE URETERS INTO THE LARGE BOWEL

ELIMINATION OF INFECTION AS AN ELEMENT OF DANGER*

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PORTLAND, ORE.
Clinical Professor of Surgery, University of Oregon Medical School

Since the presentation of the original operation for submucous implantation of the ureters into the large bowel before the American Medical Association at St. Louis in June, 1910, at which time five undamaged kidneys from dogs on whom this operation had been done were submitted to the surgical section, a sufficient number of operations upon patients have been done to prove conclusively that, after a valve action has been established by this method, there is relatively little danger to the kidney as a late development (fig. 1). The greater number of these operations have been performed by Dr. Charles Mayo, Dr. W. E. Lower and myself, although there have been many operations done by isolated operators who have made no particular feature of this work. Both experimentally and clinically, it had been shown that it was not safe to attempt to transplant both ureters at the same operation, as the edema incident to such an operation seemed to block the ureters for a time. But, even with the implantation of one ureter at a time, violent reaction is frequently noticed, particularly at the time of transplantation of the first ureter, and the mortality from infection emanating from the site of implantation has been considerable.

In the May, 1925, issue of Northwest Medicine, I presented a preliminary report describing an operation in which a tube was placed in each ureter and by which it was possible to transplant the ureters simultaneously. By this means temporary obstruction of the ureter incident to the operation was obviated. But the danger of infection emanating from the site of implantation still remained. Also there was the problem of getting the proper type of tube with sufficiently large caliber to carry the urine for several days before obstruction by incrustation took place, and yet which was sufficiently stiff to permit tying a strangulating ligature around the ureter and tube.

And so I began industriously to work out these problems in an experimental way, using dogs. Gold tubes, silver tubes and a variety of rubber tubes were tried without satisfaction. Finally, after having discovered that the ordinary small ureteral catheter used by urologists had its lumen blocked with incrustation within a day or two, I decided to see if I could have larger sized ureteral catheters made to order. Fortunately, upon investigation I found that C. R. Bard, Inc., 79 Madison Ave., New York City, made ureteral catheters of sizes as large as No. 12. But, owing to the smooth surface of such a catheter, there was no way to anchor the ureter to the catheter. Therefore, a small cuff of soft rubber tubing was slipped over the catheter and fastened there by a ligature or two, making an ideal arrangement.

Fig. 1. A perfectly developed and mature girl of 16, in whom both ureters were transplanted at the age of six for exstrophy of the bladder, is here used to represent a typical end result. Weight 115 pounds. Urine retained all night and for four or five hours at a time during the day. Patient perfectly happy and in perfect health now and during the intervening ten years.

The problem of making the bowel as nearly aseptic as possible still remained. In order to properly cleanse the bowel, a rubber covered clamp was placed on the sigmoid above the field of operation. A sigmoidoscope was introduced into the rectum. A large trocar needle attached to an irrigator was inserted through the wall of the bowel and water from the irrigator was used to flush out the bowel through the sigmoidoscope until it was entirely clean. After the water was drained out, the obturator was inserted in the sigmoidscope and the instrument was carefully guided up through the sigmoid to the point where the intestine was clamped. Through the sigmoidoscope dry gauze was packed into the lower bowel until the intestine was completely stuffed with it. Through the stab wounds in the mucous membrane, at the lower ends of the incisions in the wall of the bowel, the ends of the two catheters were fastened to the gauze with sutures. As the gauze was withdrawn from the rectum, the catheters were pulled through the bowel and out through the anus until the ureters had been brought well into the wounds in the intestine and properly sutured in place.

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* The details of the technic of actual implanting the ureters into the bowel wall may be found in December, 1927, issue of Surgery, Gynecology and Obstetrics, pages 816-819, under the title, "Completed Aseptic Technique for the Implantation of the Ureter into the Large Bowel."

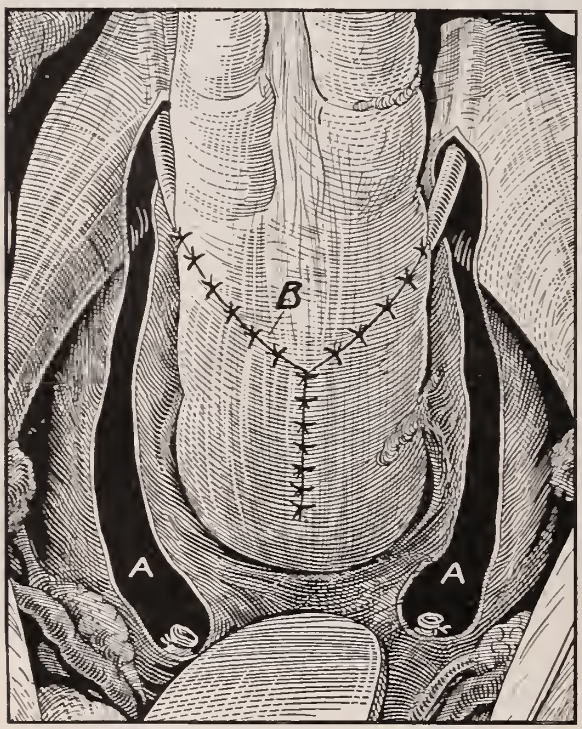

Fig. 2. Experimental bilateral transplantation of the ureters. Both ureters enter the mucous membrane through a single opening.

a. Incision in posterior parietal peritoneum, through which ureters have been elevated. Incisions to be sutured. Ligated distal stubs of ureters were seen in the wound. Drains may be placed at this point, if desired.

b. Suture line covering implanted ureters.

This technic was used successfully in a number of dogs but has not been used clinically. Probably not as good as the technic described in figs. 3 and 4.

Many experiments were made on dogs. In some instances, the two incisions for the two ureters were made opposite each other and were extended down the front of the intestine in a longitudinal incision, both ureters and tubes passing through this same opening in the mucous membrane (fig 2). The best results seemed to be obtained when the ureters were implanted at different levels (figs. 3 and 4).

This technic was first presented as a scientific exhibit at the meeting of Pacific Northwest Medical Association in July, 1925. Again, the technic with results of operations on dogs was presented at the meeting of the Clinical Congress of the American College of Surgeons at Philadelphia in October, 1925. In order to make sure that there could be no mistake, I withheld the publication of the technic until I could repeat my experiments and add greater experience.

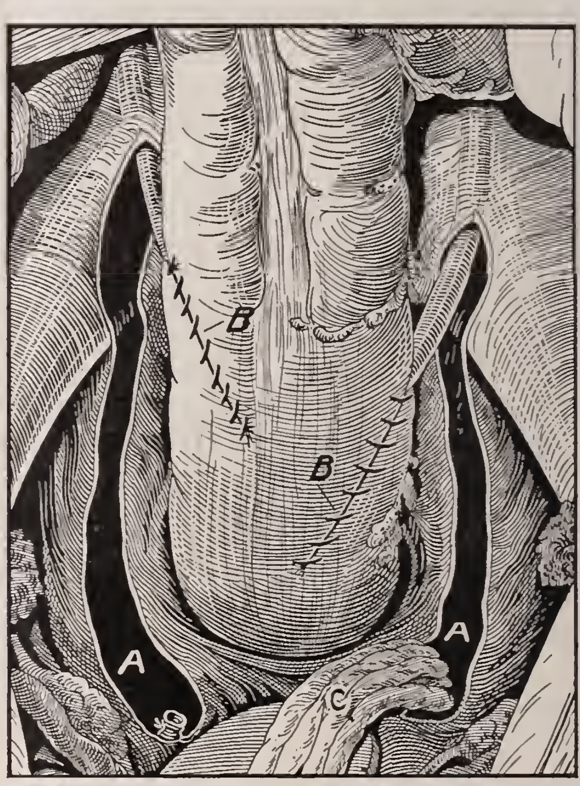

Fig. 3. Bilateral transplantation of ureters at different levels in the intestine. The operation of choice and the one which has been used in the four cases reported.

a. Slit in posterior perietal peritoneum, through which the ureter has been lifted from its bed. Ligated distal stub of right ureter is seen in the wound.

b. Suture line covering implanted ureters.

c. Gauze wicks placed through the splits into retroperitoneal space to be included as cigarette drain in the quarantine made of guttapercha tissue.

On February 12, 1927, I used this completed "aseptic technic" for bilateral transplantation of the ureters for exstrophy of the bladder in an infant twenty months old (fig. 5). The result was so startlingly different from any case of ureteral transplantation that I had ever had before, in that the recovery was practically without incident, that I decided to publish the technic. It was published in

Surgery, Gynecology and Obstetrics, December, 1927, under the title, "Completed Aseptic Technic for Implantation of Ureters into the Large Bowel." In this article I neglected to mention that, in the case of this child, I had also used drainage coming from the lower end of the posterior peritoneal incision through which the ureter had been lifted from its bed.

Since this article was published, I have performed three other operations, in all of which I have used drainage and in all of which the recovery has been almost without incident. So I am wondering if it is not wise to make drainage a routine procedure, although I am not certain on this point. In figures 3 and 4 the method of drainage I have used is illustrated. It might be that small drains of folded guttapercha tissue or rubber tubes would answer the purpose just as well, but I think a broad sheet of rubber tissue shutting off the drains from the free peritoneal cavity, acting as a quarantine, more effectively prevents any postoperative intestinal obstruction as well as doing a little better work as a drain.* However, the question of drainage may be left to the choice of the operator doing the work and will no doubt be suited to the individual case at hand if it is to be used at all.

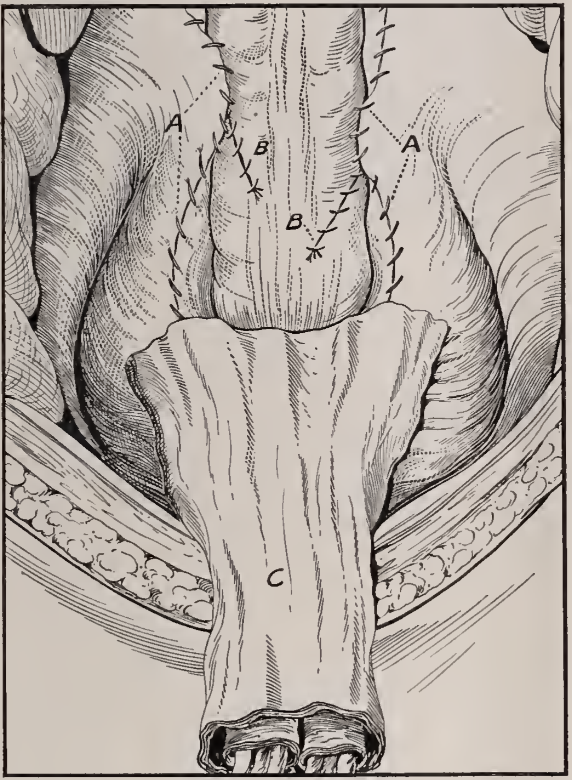

Fig. 4. Completed operation of bilateral transplantation of the ureters into the lower pelvis colon at different levels. Details were given in December, 1927, Surgery, Gynecology and Obstetrics, under the title, "Completed Aseptic Technic for Implantation of Ureters into the Large Bowel."
a. Sutured incision in posterior parietal peritoneum.
b. Suture lines covering the implanted ureters.
c. Guttapercha tissue quarantine surrounding two cigarette drains which extend into the retroperitoneal space at the lower angle of the incision of the posterior parietal peritoneum.

While four cases, when taken alone, are of course insufficient as evidence on which to recommend such a serious operation, nevertheless I feel that the almost entire freedom from postoperative manifestations (certainly not more than accompanies drainage of the common bile duct for gallstones) which has followed these four operations is in such sharp contrast to other operations I have done for implantation of even a single ureter, one is justified in recommending this operation as follows:

1. For exstrophy of the bladder.
2. As a pallative remedy in cancer of the bladder and prostate.
3. As an essential step in radical removal in cancer of the bladder and uterus, or bladder and prostate.
4. For incurable vesicovaginal fistulae.
5. For incurable perineal fistulae, encountered in certain serious diseases of the bladder.

Fig. 5. Child (male), on whom bilateral transplantation by this method was done February 12, 1927, when child was twenty months old for exstrophy of the bladder. No. 8 ureteral catheters were used. One catheter came away four days after operation; the other catheter obstructed on the fifth day and was removed through rectal speculum. This photograph was taken three months after he had left the hospital. Child is perfectly healthy, holds urine from three to six hours in rectum without distress. As far as can be determined, he is a perfectly normal, healthy, happy child.

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* Application of the Principle of the Quarantine in Abdominal Surgery, Annals of Surgery, June 1927, pages 808-821.

Fig. 6. Photograph (three months after operation) of a woman, 38 years of age, who was operated upon Feb. 22, 1928. The ureters were transplanted simultaneously, by the "aseptic technic," for hopelessly incurable carcinoma of the bladder and vagina originating in the cervix, with the understanding that the transplantation was done for the purpose of relieving her intolerable distress. No. 10 ureteral catheters were used. Catheters removed on the tenth day, piece of dead ureter end coming with them. Bladder distress entirely relieved. Patient happy and taking radium for the extensive cancer of the bladder, vagina and cervix. Patient has no fever and no distress from the bladder. She sometimes holds the urine all night, more generally gets up once in the night. Urine usually discharges separately from the feces and is practically as clear as urine from the bladder.

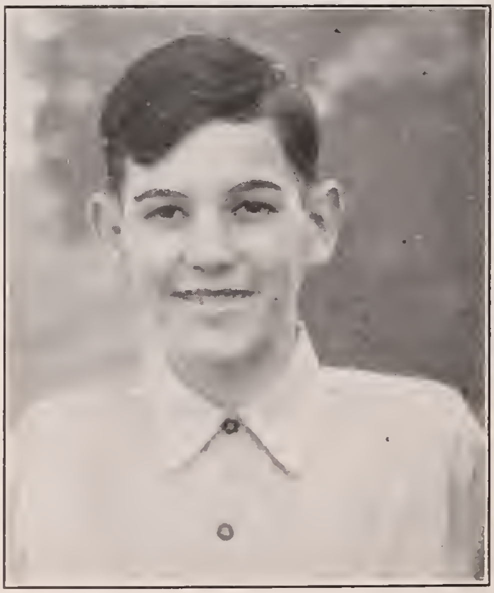

Fig. 7. Fifteen year old boy operated upon at Doernbecher Hospital, Portland, Ore., in association with Dr. W. H. Bueerman, April 4, 1928, for exstrophy of the bladder. No. 12 ureteral catheters were used. Catheters removed on the twelfth day without force. Photograph taken six weeks after the operation. Some fever followed operation in this case with some tenderness over the right kidney which has gradually disappeared. Boy is exceedingly happy over his changed status.

Fig. 8. Photograph of a woman, 39 years of age, who was operated upon April 10, 1928, for incurable vesicovaginal fistula. Many operations had been performed and only a small fragment of bladder remained. The space occupied by the bladder was scar tissue. Ureters dilated to the size of a man's index finger. No. 12 ureteral catheters were used. The left catheter came away on the fifth postoperative day. The right catheter began to close on the sixth day, leakage around it on the eighth day, removed on the tenth day and brought with it an inch of dead ureter which had protruded into the intestinal lumen. (Any portion of the ureter which protrudes into the intestinal lumen apparently dies back to the mucous membrane and comes away with the catheter.) Photograph taken May 10, 1928, as patient was leaving the hospital in the most happy frame of mind. No fever. Usually passed the urine at bed time, 1 a. m. and 6:30 a. m.. No distress of any kind. I have never seen a happier patient.

6. For scarred, contracted bladders in which great pain and inconvenience is experienced.

7. For incurable incontinence of urine from any cause.

8. For extensive incurable ulcerations of the bladder, either tuberculous or otherwise, where it can be demonstrated that at least one kidney is sound.

In short, I believe it is justifiable in any condition where the bladder is hopelessly diseased or is completely useless as a reservoir. This statement, of course, is based upon the presumption that only skilled abdominal and intestinal surgeons are to do the operation for, unless every feature of the technic is carried out with meticulous care, it must always be a dangerous operation.

Four consecutive cases in which simultaneous bilateral transplantation of the ureters has been done by the above described technic are shown in figures 5, 6, 7 and 8.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington and Idaho

Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

JUNE, 1928

EDITORIAL

THIS SURGICAL NUMBER

The contents of this issue have been supplied by members of the Seattle Surgical Society which is one of the oldest special societies in the Northwest. Its membership is limited to thirty. At its annual meeting in January of each year, a prominent surgeon is invited from the East to be the guest of honor and is given an honorary membership. Clinics are held at this time, to which members of the medical profession of the Northwest are invited who are particularly interested in surgery. The society meets monthly during the year, when one of the members presents an original paper and other members present case reports.

This journal realizes that these smaller societies are doing excellent work in their various spheres of activity and is pleased to devote an issue from time to time exclusively to papers from their memberships. In this way it feels better work can be stimulated among members of the profession and assistance can be rendered in creating a literary atmosphere in the medical circles of the Northwest.

THE REAL SURGEON

Is the man who spends a great deal of time in the intricacies of diagnosis and looks for unusual signs, who is always looking for something on which to display his art or who is anxious to build a large clientele, to operate on a number of cases daily, to amass statistics, to be known throughout the country as having a large practice, is he the real surgeon, or is it the man who has had an efficient training in college, in hospital work, in the preliminary practice of medicine, who has a full knowledge of the normal processes of people and their ways when subject to the vagaries of disease, in the interpretation of symptoms, in the correlation of these for diagnostic and prognostic purposes and in their evaluation for the purpose of determining what good or harm surgical procedures may do the patient?

A safe surgeon is one who takes all possible necessary means (avoiding the unnecessary) of studying his patients and preparing a diagnosis, based upon past and present facts, with sufficient mental equilibrium to determine the purpose of surgery and to judge if that purpose is solely for the benefit of the studied patient. Further, a real surgeon knows that he simply aids by putting parts in such condition that the processes of the bodily functions can return to normal, that he only cures by removal of offending diseased organs or pathology, and he has learned to know that many conditions can be cared for by normal bodily processes without his interference. He is one who has learned that early surgery leaves his patient much less vulnerable and realizes that living is much more worthwhile than if surgery were done late. No man can ever become a truly great surgeon who has not been endowed by birth with a proper conscientious regard (the surgical conscience) for the welfare of his fellow man.

Finally, a real surgeon has learned that without the great healer, Nature, his surgery is of no avail and that nothing he can do is so wonderfully grand as that which the great healer is awaiting his intelligent aid to accomplish. A great surgeon bows with humility as he compares his humble ability with the supreme powers of Nature.

HOSPITAL STANDARDIZATION

The case reports in this issue focus attention upon the improvement in case records of the various hospitals which have subscribed to the hospital standardization movement of the American College of Surgeons. This movement has now developed to such a degree that standardization has been accepted by practically all hospitals of the Northwest and has become a part of hospital routine. No case report is complete without all of the proper laboratory tests having been incorporated in the case record, with the conditions found at the time of operation fully described, the pathologic report of the specimens removed, and many times a drawing illustrating the gross pathology, with a microphotograph of the histopathology.

As time goes on, the accumulation of these case reports in the individual hospital will furnish the material for exhaustive studies by those interested in some particular subject. The accumulation, however, of data of little of no value in case records has become a considerable problem in the larger institutions, where the daily turnover of cases reaches the higher numbers. A turnover of twenty-five patients a day would mean approximately eight thousand case records per year. If each case record, in addition to the history, contains the laboratory tests, the operative and extensive progress records, a graphic chart and the nurses' records, fifteen to twenty pages would be used in each case. Over a period of ten years, one can easily estimate the space necessary to house such material.

Some hospitals have adopted a rule that requires only the briefest of notes for the cases having uneventful recoveries. The graphic chart is all that is essential for both the nurses' notes and the pulse, temperature and respiratory findings. This eliminates approximately five pages on the average case. A further saving could be had by simplifying the laboratory chart contents into one page. A still further economy might be obtained by using the reverse sides of all pages. Lastly, the destruction of all material except a well-written summary of the case might be advisable after a period of three years. Simple cases, such as minor operations and acute illnesses, with no resultant pathology, might be entirely destroyed at the end of the year, keeping only a summary card.

In the radiographic department, where another accumulation of records is forming, all films not of good quality might be destroyed at the time of filing the records. This would perhaps diminish the bulk by 25 per cent during the year. Normal pathology could be listed on the card and the entire set destroyed in many cases, where films are taken for diagnostic purposes only.

In the laboratory the tissues removed at the time of operation again cause a large accumulation which has to be housed. Some hospitals make use of the permanent mounted sections of pathologic tissue, destroying the normal tissue but keeping a card index of the same. These hospitals do not make any effort to retain a museum of specimens. It would seem that at least an accurate record should be kept in the laboratories of all pathologic tissues removed. The keeping of slides in private hospitals, while excellent from the standpoint of study, as a rule is not of much practical use.

One of the greatest values derived from the development of hospital standardization is the gradual evolution of the staff meetings. At first they were in reality small meetings of the county medical society. Gradually papers have been eliminated and interesting cases occurring in the hospital during the month have been utilized for purposes of study at the staff meetings. The alert pathologist may diplomatically suggest improvements from his standpoint, while the roentgenologist frequently can offer suggestions for the improvement of the service in his particular department. Thus, the cooperation between the various departments adds to the improvement of the entire institution.

Perhaps the greatest fault of standardization at the present time lies in the erroneous conception of the position of Chief of Staff. Few men are able to hold this position for more than a year and keep up the enthusiasm of the staff. In those hospitals where the Chief of Staff serves for one, or at most two years, the greatest progress is noted, while in those hospitals where there is no change in the executive personnel of the staff, little if any advancement is taking place.

ETHICS OF CONSULTATION

One of the most trying problems that physicians experience in referring patients to others for examination is found in the practice, in which consultants occasionally indulge, of referring the patient to a second consultant without first taking up the matter with the physician who originally sent him in. For example, a patient suffering from some internal disorder is referred by his physician to a specialist for the removal of a focus of infection. The operation is performed without obtaining the desired results. Quite naturally the patient discusses his illness with the consultant, who comes to the conclusion that the disorder may be elsewhere than as originally diagnosed, whereupon he advises examination by another specialist whom he names.

Notwithstanding that this is done with good intent, it is, of course, an improper method of procedure that is almost certain to cause dissension and possibly ill-feeling between the first physician and the first consultant, unless they are close friends, in which case either is usually quite willing to forgive an oversight on the part of the other on the theory that it was unintentional. But if they are not close friends, such an occurrence may result in a break between them and may cause no little dissatisfaction.

Consultants obtain much of their income through the good will of other physicians. Rarely do they care to treat unkindly those who have sufficient confidence to refer patients to them. But in the hurry and worry attendant on a large practice, problems such as that described sometimes present which seemingly must be adjusted at once and, when they are settled as was this purely imaginary case, the first physician has a right to feel aggrieved. Rarely is such an error intentional, but whether so or not the first physician not infrequently loses his patient and with it some of his old time good will for his erring brother. The proper procedure in such a case would be for the consultant to send the patient back to the first physician after calling him up and telling him what he suspects. The original physician will often benefit from a conference of this kind, though in most cases he is already aware of the possibilities and perhaps has in mind a conference with a second specialist colleague of his own selection, his first reference having been but a step in his plans for curing the patient.

In every case in which two or more physicians are associated, one must assume leadership. All others called in serve in a secondary capacity. The man who first treats the case has a right to this leadership until definite procedure is agreed upon. Most physicians these days have confidence in numerous colleagues and, when a case arises where help is required, the original physician frequently selects someone to whom he feels safe in sending his patient without being on hand for an actual bedside consultation. His confidence is not only in his friend's ability but in his integrity, and he expects not only that his patient will be well and thoughtfully treated but that the consultant will not forget he is under obligation to see that the patient is returned, with no impairment of prestige of either doctor. Most consultants in taking a patient's history note the source from which he comes and are careful to preserve the rights of their colleagues. But it is easy to forget, and instinctively to follow their own ideas in regard to further care. Instances such as the example cited are not uncommon. They are preventable and should be avoided in the interests of amity and good will of an always more or less harassed profession.

MEDICAL COOPERATION

A recent editorial appeared on medical ethics which stressed the value of cooperation in the following well chosen words. "The wise physician is he who speaks well of others in practice, and everything that contributes to mutual good will is helpful to everyone who makes his living through the healing art." We must all recognize the truth in this statement and would not willfully and knowingly violate its principles. Yet there are many physicians who unwittingly violate the spirit of cooperation by patronizing lay laboratories, both clinical and x-ray.

Any patient with sufficient confidence in a physician to employ him believes that he will have his laboratory work done by the most competent laboratory. If the patient is sent to a lay laboratory, it follows that the latter is more efficient than one under the direct charge of a physician. This belittles the work done by the regular doctor's laboratory and reflects on the geenral medical profession just as surely as if the attending doctor openly depreciates a fellow practitioner. The confidence of the doctor in the lay technician is leading the commercial laboratory into broader and broader fields, encroaching more and more on the province of the attending physician, thereby cheapening his work in the eyes of the public and fertilizing the soil for the propagation of the various cults.

Unionism has learned the lesson of cooperation and the union label is one of their means of protecting the idea. An official of a county society said in a recent conversation, "You cannot get a group of doctors to agree on anything. If there is any work to be accomplished, some one man or small group must go ahead and do it and expect criticism from many sources." Is the medical profession more ignorant of the benefits of cooperation than the labor unions? We think not, but feel that the aparent lack of fellowship is due to carelessness. No one has brought the facts home to us and we have not stopped to think it out for ourselves. Practically all our meetings and even social gatherings are given over to the discussion of the particulars of "a case I once had." The business end of medicine is very rarely discussed, but no union labor meeting would be a success which did not foster the idea of cooperation. Cooperation of physicians along these lines would blot out the commercial laboratory over night and would be a body blow to the various cults as well as redound to the benefit of our patients.

LOSS OF A GREAT SCIENTIST

Reports have been made and passing notice has been given of the death of Hideyo Noguchi from yellow fever in Africa. As far as popular consciousness is concerned his name is perhaps not well known and will soon be lost to the minds of men. It is curious how quickly are forgotten those great figures who make the supreme sacrifice in the interest of pure science, compared to the memorials, statues and other modes of commemoration accorded those of distinction in political or military achievement. While those who have given all in the quest of knowledge to relieve human suffering and prolong human life without personal gain or self aggrandizement are numerous, few are known or remembered by the beneficiaries of their labors. Pasteur contributed more to the welfare of the human race than all the inventors, statesmen, manufacturers, princes of industry, aviators and military geniuses of any generation combined. Hunter, Jenner, Lister, Virchow, Walter Reed and his associate Lazear and many others deserve the tribute of all mankind but how few know or care what benefits their lives afforded.

To such a group belongs the name of Noguchi, a Japanese scientist of the Rockefeller Institute for Medical Research, who died at the front, searching for further information concerning that scourge, yellow fever. Dr. Noguchi contributed much to medical knowledge. He was the first to demonstrate unquestionable association between syphilis and general paresis and locomotor ataxia, and to cultivate in pure form the treponema pallidum; he cultivated the causative element of infantile paralysis and of rabies; he introduced a skin test for syphilis and a method of preparation of a bacteria-free smallpox vaccine; he isolated and cultivated the causative organism of yellow fever and developed a preventive vaccine and curative serum for that disease.

In recognition of these contributions honors have been accorded him in every part of the world by those scientific bodies capable of appreciation of such work, but even we of the medical profession are too much inclined to regard such lives as a matter of course and of passing interest. As for general appreciation of such service more laud is given to any smart quack, who without knowledge, background or labor sets himself forward as qualified to recognize and cure all the ills of mankind with some single method of healing, be it with drugs, rubs, talk or prayer, than to men of this type. It is our duty and privilege to maintain that great distinction of medical science from the rabblement of charlatanism, namely, the prosecution of scientific research independent of fees and pecuniary gain and aloof from the commercial temptation of the times.

PACIFIC NORTHWEST MEETING AT TACOMA

Plans for the meeting of the Pacific Northwest Medical Association in Tacoma July 5-7 are nearing completion. The headquarters will be at the Winthrop Hotel. There will be a joint session in the morning hours, the afternoon hours being divided into surgical and medical sessions. The convention rate of a fare and a half identification plan has been granted by the railroad companies from all points within the territory except those along the Canadian Pacific. For those traveling in groups of fifteen or more, a fare and one-third has been granted. Cities like Spokane, Portland and Seattle may have this rate on fifteen or more traveling on the same train. The following is the program as it now stands:

Professor Tom Addis, Stanford University Medical School, San Francisco.
1. The Diagnosis of Bright's Disease.
2. The Etiology and Prognosis of Bright's Disease.
3. The Treatment of Bright's Disease.

Dr. Walter C. Alvarez, Mayo Foundation, Rochester, Minn.
1. How to Diagnose Gastrointestinal Diseases from the History.
2. Recent Laboratory Discoveries of Interest to Practicing Physicians.

Dr. Isidore Cohn, Clinical Professor of Surgery, Tulane University, New Orleans.
1. Personal Experiences in Abdominal Surgical Emergencies.
2. The Significance of Pain in the Extremities.
3. Contusions and Sprains.

Professor Carl A. Dragstedt, Professor of Pharmacology, Northwestern University Medical School Chicago.
1. The Present Status of the Adrenal Problem.
2. Experimental Studies in Intestinal Obstruction and Intestinal Toxemias.
3. Recent Advances in Pharmacology.

Professor Charles A. Elliott, Northwestern University Medical School, Chicago.
1. A Discussion of the Diagnosis, Treatment and Prognosis of Pernicious Anemia Prompted by Results Obtained with Liver Feeding.
2. The Cardiovascular Manifestations of Hyperthyroidism.
3. The Treatment of Hyperthyroidism by Maximal Thyroidectomy in Patients Under Iodine Control.

Professor Leo Eloesser, Stanford University Medical School, San Francisco.
1. Treatment of Pulmonary Suppuration—Abscess.
2. Treatment of Pulmonary Suppuration—Bronchiectasis.
3. Some Forms of Gangrene of the Extremities and Their Treatment.

Professor Ludvig Hektoen, Director of John McCormick Institute for Infectious Diseases, and Professor of Pathology, University of Chicago.
Two lectures on Practical Applications of Immunology.

Dr. J. C. Litzenberg, Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis.
1. Sterility.
2. Ectopic Pregnancy.
3. Myomata of the Uterus in Pregnancy and Labor.

Dr. Frank C. Mann, Mayo Foundation, Rochester, Minn.
1. Physiology of the Liver.
2. A Physiologic Consideration of Jaundice.
3. The Mechanism of the Biliary Tract.

Professor Jonathan Meakins, McGill University Medical School, Montreal.
1. The Significance of Symptoms in Circulatory Disease.
2. The Pathology and Clinical Course of Subacute Bacterial Endocarditis.
3. Recent Advances in the Knowledge of Icterus and Their Clinical Significance.

Professor Dallas B. Phemister, University of Chicago Medical School.

1. Correlation of Pathologic and X-ray Studies in the Diagnosis of Bone Tumors.
2. Unusual Forms of Osteomyelitis.
3. Causes and Treatment of Circulatory Collapse in Surgery.

Dr. William F. Reinhoff, Jr., Associate Professor of Surgery, Johns Hopkins Medical School, Baltimore.

1. Diseases of the Thyroid Gland.
2. Arteriovenous Fistulae.

Professor Carl J. Wiggers, Department of Physiology, Western Reserve University School of Medicine, Cleveland.

1. Laboratory and Clinical Methods of Studying the Heart Beat by Means of Graphic Records.
2. The Physiologic Basis for the Clinical Interpretation of Cardiac Irregularities.
3. The Physiologic Principles Underlying the Adaption of the Heart to Various Conditions in Health and Disease.

Membership dues are as in the past $10.00 for this course of lectures, and are now due and payable to Dr. Frederick Epplen, 1509 Medical and Dental Building, Seattle.

MEDICAL NOTES

Gorgas Memorial Laboratory. A bill passed the recent session of Congress, authorizing the expenditure of $50,000 for the construction of a laboratory at the city of Panama, or upon a site in the Canal Zone. This will be constructed under the direction of the Gorgas Memorial Institute. Provision is made also for the appropriation of $50,000 for a five-year period for maintenance and operation of such laboratory. Each Latin-American government is invited to contribute to the support of this institution.

The American Association for the Study of Goiter will hold its annual meeting at Denver, Colo., June 18-20. Papers on all phases of the goiter problem will be presented. The program includes papers by men interested in the goiter question from all parts of the country. The Pacific Northwest is represented by papers from J. Earl Else, Portland; B. T. King, J. T. Mason and J. C. Moore, Seattle.

OREGON

Research Prize Awarded. Dr. Olof Larsell, professor of anatomy at University of Oregon Medical School, Portland, and Dr. Ralph Fenton, also a faculty member of the medical school, received notice May 3 that the Council of the American Laryngological Association had awarded them the Casselberry prize of five hundred dollars. This prize, the purpose of which is to stimulate research in the field of laryngology, has not been awarded for several years. The Portland doctors' investigations led to the discovery of the nerve pathway by which pain is referred from the throat to the ear. Dr. Fenton presented these research findings last month before the American Laryngological Association and the American Otological Society at their meetings in Washington, D. C.

Reserve Officers Entertained. The reserve medical officers of the 96th division with their families were the guests of Major D. C. Mallory and Colonel H. M. Greene, May 20, at a barbecue dinner at the latter's country estate near Oswego. Addresses were made by several of the guests, including General James F. Reeves, Colonel Frederick T. Arnold and Dr. Frederick Stricker, Oregon State health officer.

Portland City-County Medical Society, at a meeting at the Portland Woman's Club Building May 2, was addressed by Dr. Clifford J. Barborka of the Mayo Clinic, Rochester, Minn., who spoke on the subject of "The Ketogenic Diet in the Treatment of Epilepsy." Dr. Frank B. Kistner also addressed the society.

Jackson County Medical Society, at a meeting in Medford May 2, was addressed by Drs. F. D. Stricker, L. H. Smith and Guy Strohm of Portland.

Dr. A. J. Fawcett, who has been practicing at Amity, has returned to Glendale, where he formerly resided.

WASHINGTON

Community Opposes Tuberculosis Hospital. While the commissioners of King County have been considering plans for enlargement of the King County hospital at Georgetown, including a new tuberculosis ward, residents of the affected district have been uniting to oppose the creation of any facilities for the care of tuberculous sufferers in that district. In petitions presented to the commissioners it was alleged that a tuberculosis hospital would be a menace to community health and would tend to decrease property values.

Hospital Day Observed. The Walla Walla Medical Society cooperated with the American Hospital Association in the observance of National Hospital Day May 12. Each of the Walla Walla hospitals was open for inspection to the public. The medical society held clinics in several hospitals during the morning. Dr. G. A. Downs of Spokane made an address on a neurologic subject and demonstrated patients at the State Penitentiary hospital. In the evening there was a banquet for physicians and a public health meeting for the general public.

Medical Building For Tacoma. Mr. C. B. Hurley, of the Hurley-Mason Company, recently announced that his company intends to erect at Tacoma in the near future a ten to twelve story modern office building for the exclusive use of physicians and dentists. A site for the new structure will be determined at an early date. Construction is expected to commence August 1.

Hospital Executive is Visitor. Dr. Malcolm T. McEachern, director of hospital activities for the American College of Surgeons, was a visitor in several hospitals in Washington during May. On May 9 he was the guest of honor at a dinner given by the staff of the Longview Memorial Hospital at Longview. He is engaged in a survey of hospitals of the Pacific Northwest.

Gift to Pioneer Physician. A group of thirteen patients and friends of Dr. Lewis R. Dawson, veteran Seattle physician, in appreciation of years of devoted professional service, recently presented him with a luxuriously appointed automobile. Dr. Dawson began practice forty-four years ago in Belltown, which later became a part of Seattle. He is a veteran of the Spanish-American War, in which he served as chief surgeon of the First Washington Infantry, United States Volunteers. He has always maintained an active part in the professional and civic life of his home city.

Clinical Meeting at Spokane. The Spokane Clinical Society held its annual clinics in Spokane May 25-26, to which several hundred physicians of the Inland Empire were invited. The program consisted of clinical and laboratory demonstrations in several Spokane hospitals, supplemented by motion picture films prepared under the direction of the Mayo Clinic at Rochester, Minn. The meeting culminated in a banquet at the Spokane City Club.

Snohomish County Medical Society met in Everett May 1. Dr. A. C. Leslie of Monroe, vice-president of the society, presided. The principal address was made by Dr. Roger Anderson of Seattle, who discussed the treatment of fractures. His address was illustrated by pictures.

Clallam County Medical Society met at the Port Angeles Hospital, Port Angeles, May 8. Dr. Lester Palmer of Seattle addressed the members on diseases of the heart, while Drs. J. A. Weber and Charles R. Castlen discussed pulmonary conditions.

Klickitat-Skamania Counties Medical Society held a meeting at Goldendale May 26.

Dr. J. H. McGranahan, who has been engaged in practice at Vashon Island, has left to specialize in surgery in an eastern medical center. His place will be taken by Dr. Frank H. Grandy, a graduate of the Indiana University School of Medicine, who has been connected with the Northern Pacific hospital at Tacoma for the past three years.

Dr. J. A. True of Spokane left recently for several months' travel and medical study in Europe. Part of his time abroad will be spent in Vienna. His Spokane practice is being cared for by Dr. A. E. Lien.

Dr. J. Wilson Reed, who has been engaged in practice in Montana and in Minnesota, has located at Valley, where he has assumed management of the Vallamont hospital.

Dr. J. C. Richey, formerly of Hamilton, has located for practice at Marshfield.

Dr. William P. Rice of Shelton has moved to Tacoma, where he will practice.

Dr. B. J. Ellis of Waterville has leased the hospital formerly operated by Mrs. Effie Smith. He has moved his office to the hospital building.

Medical Wedding. Dr. Joe Bittner and Miss Bernadine Ditter, both of Yakima, were married in that city May 1.

IDAHO

Recent Licentiates. At a recent meeting of the Medical Examining Board licenses were granted by examination to D. B. Bell and N. L. Hersey, Spokane. G. E. Snyder, Nez Perce. The following were licensed by reciprocity: W. W. Cook, Pasadena; C. E. Palmer, Ontario, Ore.; H. R. Bankerd, Newport, Wash.; E. F. Balcom, Los Angeles; W. H. Innis, Stockton, Calif.

Hospital Changes Hands. Dr. O. D. Platt, who has practiced at St. Maries for the past twenty years, has disposed of his practice and his interest in Platt's hospital to Dr. G. G. Espe, who has been his associate for the past year. Dr. Platt intends to retire from active practice for at least a year.

Railway Surgeons Convene. The second annual convention of the Oregon Short Line Medical Association was held May 12 at Montpelier with Dr. J. C. Landenberger, Salt Lake City, Utah, chief surgeon of the railroad, presiding. Dr. J. R. Morrell of Ogden, Utah, is president of the association.

Southwestern Idaho Medical Society has elected the following officers for the ensuing year: President, Dr. T. N. Braxton, Boise; secretary, Dr. A. B. Boeck, Boise.

Tricounty Medical Society has elected the following officers for the ensuing year: President, Dr. F. C. Gibson, Potlatch; secretary-treasurer, Dr. J. H. Einhouse, Moscow.

Dr. N. R. Wallentine, Sandpoint, has gone to Europe where he will pursue postgraduate work, in continuation of studies he has recently followed in New York.

Dr. E. L. Spohn, formerly of Walla Walla, Wash., has located for practice at Priest River, going there from Coeur d'Alene.

Dr. J. C. Wiik of Moscow will spend several months on a European visit. He will attend clinics at Berlin and Vienna. Dr. D. B. Bell of Spokane will care for his practice during his absence.

Dr. H. R. Bankerd, formerly of Newport, Wash., has moved to Harrison, where he will engage in practice.

Dr. Warren H. Innis has located for practice at Boise.

Medical Wedding. Dr. James E. Manuel of Boise and Miss Mildred Gee of Gooding, were married at the parsonage of the Methodist church in Gooding May 6.

OBITUARIES

Dr. E. Arthur Johnson, Seattle, Wash., died at his home May 16, following an illness of six months' duration, aged 32 years. He was born at Denver, Colo., in 1896, and graduated from Rush Medical College, Chicago, Ill., in 1921. After an eighteen months service as intern at Cook County Hospital, Chicago, he located for practice at Seattle, where he became associated with the Roosevelt Clinic, in the capacity of urologist.

Dr. John C. McCauley, one of the pioneer physicians of Ellensburg, Wash., died suddenly at his home May 19, aged 67 years. He was born in 1861 at Cedar Rapids, Iowa, and graduated from the Willamette University Medical Department in 1884. He first practiced at Brownsville, Ore., and in 1889 moved to Ellensburg, where he remained until the time of his death. He was actively associated not only with the medical activities but also with the political development of Kittitas County. He served two terms as mayor of Ellensburg. In 1920 he was elected state senator, a position which he held up to the time of his death.

Dr. Frederick W. Prentice, Eugene, Ore., the oldest physician of Eugene, Ore., died at his home May 16, aged 84 years. He was born near Colchester, England, in 1844. He graduated from the Cincinnati College of Medicine and Surgery in 1878 and from the University of Pennsylvania Department of Medicine in 1887. He came to the United States in 1868 and for several years was engaged in teaching at the University of Illinois. Later he settled at Eugene, where he remained in active practice until the time of his death.

Dr. W. Grant Tucker, Dunsmuir, Calif., died in San Francisco May 5, aged 60 years. He was born in 1868, and graduated from University of Michigan Medical School in 1893. He practiced medicine in Seattle, Port Gamble, Port Townsend and Cosmopolis, before moving to California four years ago to become surgeon for the Southern Pacific Railroad at Dunsmuir.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., E. L. Zimmerman; Secty., C. E. Hunt

Central Willamette Medical Society entertained Dr. Clifford J. Barborka of the Mayo Clinic, Rochester, Minn., at a banquet at the Osburn Hotel, Eugene, May 3. Sixty-five were in attendance.

Following the banquet Dr. Barborka delivered a lecture on "The Ketogenic Diet in the Treatment of Idiopathic Epilepsy."

Dr. Donald Trueblood of Seattle, Wash., spoke on "A Useful Method for the Open Reduction of Fractures."

Dr. John H. Fitzgibbon of Portland read a paper, illustrated by moving pictures, on "The Treatment of Esophageal Strictures.

SOUTHERN OREGON MEDICAL SOCIETY

Pres., E. J. Wainscott; Secty., C. J. Moser

Southern Oregon Medical Society held its 37th annual meeting at Roseburg, May 8.

At the morning session Dr. W. B. Holden of Portland gave a lecture, illustrated by moving pictures, on the subject of Intestinal Obstruction. Discussion was opened by F. G. Swedenberg of Ashland.

The afternoon program included an address by Dr. T. Homer Coffen, Portland, on "The Relation of Acute Indigestion to Heart Disease." Dr. G. E. Houck of Roseburg led the discussion.

Dr. C. Ulysses Moore of Portland made an address on the subject of "Nonsurgical Treatment of Pyloric Obstruction in Infants." This paper was discussed by Dr. W. P. Holt of Medford.

WASHINGTON

CLARK COUNTY MEDICAL SOCIETY

Pres., R. D. Wiswall. Secty., L. E. Hackett

Clark County Medical Society held a meeting in the Evergreen Hotel at Vancouver May 8. Drs. William House and F. T. Burke of Portland, Ore., were guests of the society.

Dr. House delivered an address on "Indications for Surgery with Reference to the Nervous System." Dr. Burke spoke on "Ventriculography as an Aid in Diagnosing Pathology of the Brain.

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

A general meeting of King County Medical Society was held May 7 in the auditorium of the Medical-Dental Building, Seattle, with Dr. Walter Kelton in the chair. About two hundred fifty members and guests were present including visitors from Tacoma and Everett.

Dr. Paul W. Spickard was elected to membership.

Mr. J. E. Williams of the Phoenix Mutual Life Insurance Company delivered an address, explaining the proposal to insure as many of the society as possible for $1,000 or more, the dividends of these policies to be used as a fund for the use of the Welfare Committee of the Society. He exhibited a moving picture, "Vanishing Fortunes," illustrating the principles of insurance which he described.

Dr. Walter C. Alvarez of the Mayo Clinic, read a paper, "Practical Points in the Diagnosis of Gastrointestinal Diseases." He illustrated with moving pictures the exposed intestinal tracts of animals, showing peristaltic contractures under anesthesia. Section of splanchnic nerves inhibited these actions. Formation of volvulus and intussusception were demonstrated.

The medical section of the society held a meeting May 14, with Dr. George A. Dowling presiding.

The paper of the evening was by Dr. C. H. Hofrichter on "Acute Glomerulonephritis, and its Relationship to the Development and Progress of the Chronic Nephritides." The anatomy of the kidney was briefly described, with particular attention to its vascular supply. A lack of adequate blood passing through the kidney produces albumin and casts in the urine. Their relation to acute and chronic kidney disease was described. The etiology of glomerular diseases was given in detail, under acute and chronic infection, arteriosclerosis and disturbances in metabolism. The treatment of these various conditions was discussed. Lantern slides illustrated the anatomy and physiology of the kidney. The paper was discussed by Drs. Hepler and Peacock.

Dr. Minnie Burdon presented a case of osteitis fibrosa cystica. The x-ray study was discussed by Dr. Bourns.

Dr. A. J. Lauza, Assistant Medical Director of the Metropolitan Life Insurance Company, spoke briefly on industry and its relation to medicine.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. C. Wheeler; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held at Tacoma May 8, Dr. E. C. Wheeler in the chair. Minutes of previous meeting read and approved.

A paper on "Pyorrhea, Etiology, Diagnosis, Treatment and Relation to General Health," was read by Dr. John J. McCarthy.

A paper on "Orthodontia" was read by Dr. J. W. Rawlings. "Dental Infections and Their Relation to Certain Diseases," was read by Dr. W. C. Holland of U. S. V. H. No. 59.

The following resolutions were unanimously adopted:

RESOLVED: That in the sudden passing of Ivan P. Balabanoff, M.D., F.A.C.S., one of the earliest of our Society members, April 23, 1928, after nearly forty years in Tacoma in a consistent, competent, energetic and successful practice of the eye, ear, nose and throat specialty, this Society and community have lost a most exemplary associate, benefactor and citizen.

That his career exhibited most nobly the highest virtues of our esteemed profession, sharing as little as any in promulgating the defects of his period.

That his altruistic cheerfulness, skill and courage sustained and blessed many suffering patients.

That his stabilizing habits and righteous character will remain a lasting, respectful and valuable memoriam in the hearts of all who knew him.

That while we must regret the loss of one who stood high among the flower of our association, we are humbly submissive to God's will and wisdom at this sad occasion, and we would tender our deepest sympathy to the bereaved family.

RESOLVED FURTHER: That a copy of these resolutions be sent to the family and spread on the minutes of this Society.

(Signed) C. H. KINNEAR, M.D.,
JOHN AARONSON JOHNSON, M.D.

The application for membership of Dr. Wadim J. Glovalsky of Kapowsin was read and referred to the trustees. The application of Dr. John N. Perkins, U. S. V. H. No. 59, was read and accepted.

The following officers were elected to serve for the following year: President, Dr. W. G. Cameron; vice-president, Dr. D. M. Dayton; secretary-treasurer, Dr. W. B. Penney; trustees, Drs. H. G. Willard, W. A. Monroe, S. M. MacLean; delegates to State meeting, Drs. H. G. Willard, W. B. Penney; alternates, Drs. W. D. Read, C. F. Engels.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., P. J. Gallagher; Secty., R. M. Schulte

Spokane County Medical Society held its final meeting of the season May 10 at the Hotel Spokane. Dr. P. J. Gallagher occupied the chair. Three visiting physicians from Portland, Ore., were the guests of honor.

Dr. Thomas Joyce discussed "An Analysis of Gastric Surgery." Dr. Marr Bisaillon described the use of the x-ray in the diagnosis of pulmonary disease. Dr. Frank Menue, professor of pathology at the University of Oregon Medical School, spoke upon the subject of goiter. He warned against the indiscriminate use of iodine in the prophylaxis of goiter, particularly in goiterous regions.

WHATCOM COUNTY MEDICAL SOCIETY

Pres L. P. McCalla; Secty., O. E. Beebe

Whatcom County Medical Society held its regular meeting at Bellingham, May 7.

Dr. Lyle Greenwood read a paper on "Pernicious Anemia" with report of three cases treated by liver extract and diet. Dr. J. A. Weber, Seattle, read a paper on "Bronchoscopy, Diagnosis and Treatment of Chest Conditions," illustrated with slides. It was announced that the tricounty medical meeting will be held this year in Bellingham June 13, Whatcom County Medical Society being host.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., E. C. Wheeler; Secty., A. E. Hillis

The regular meeting of the Academy was held at the Virginia Mason Hospital, Seattle, May 1. Dr. F. J. Bjerken, second vice-president, in the absence of Dr. Wheeler, presiding.

A resolution relative to the death of Dr. Ivan P. Balabanoff was adopted and the secretary instructed to forward same to the bereaved family.

Drs. Chase, Wanamaker, Davies, and Hillis reported on various phases of the Pacific Coast meeting at Santa Barbara.

A scientific paper, "Agranulocytic Angina," was read by Dr. A. B. Murphy of Everett. The literature of the disease was reviewed, the first case being reported by Shultz in 1922. The writer's case was a woman of sixty-three who developed a sore throat with redness and swelling of tonsils and pillars, high fever and prostration. Later a maculopapular eruption appeared over back and arms. Her blood picture was typical of the disease, with gradual reduction in the number of white cells down to 600 and no polymorphonuclears. All the other cases reported so far showed local exudates or ulcerations, whereas this case had none.

In discussion Dr. Davies said an agranulocytic angina must be a rather new condition or we have been passing it up in the past. There have been a great many cases reported recently, several of which he described. A typical case in Tacoma was mentioned, a girl about eight years of age was taken sick with sore throat, who developed a gangrenous condition at margin of gums; several teeth loosened and dropped out. Blood picture was 600 white, with no polys. Patient died in about eight days and postmortem findings were typical of agranulocytic angina.

Dr. Paul said when our case was in the hospital Dr. Griggs, who had resided in China, called our attention to the similarity of this condition to kala-azar which is a protozoan, but we have not overlooked anything as gross as this in our blood examinations.

IDAHO

BONNER COUNTY MEDICAL SOCIETY

Pres., E. P. Westwood; Secty., N. R. Wallentine

Bonner County Medical Society, at a meeting at Sandpoint May 1, elected officers for the ensuing year as follows: President, Dr. R. M. Bowell, Bonners Ferry; vice-president, Dr. C. P. Stackhouse, Sandpoint; secretary-treasurer, Dr. N. R. Wallentine, Sandpoint.

Dr. Alexander Barclay of Coeur d'Alene, president of the Idaho State Medical Association, was the guest of the local society and discussed the work of the state organization.

IDAHO FALLS MEDICAL SOCIETY

Pres., H. R. Hatch; Secty., J. W. West

The regular luncheon monthly meeting of Idaho Falls Medical Society was held May 4 at Bonneville Hotel, Idaho Falls. The following officers were elected for the ensuing year: Dr. Parley Nelson, president, and Dr. J. R. Sutton, secretary.

It was decided to get behind a city milk inspection ordinance. It was voted to close all offices at noon Saturdays during June, July and August. Delegates were elected to the tri-state meeting to be held in August at the Canyon Hotel at Yellowstone Park.

It was noted that "Vale Chiropractic" was drafted from NORTHWEST MEDICINE and published in local papers, causing the usual yelp from hit curs.

SOUTHWEST IDAHO MEDICAL SOCIETY

Pres., T. N. Braxton; Secty., A. B. Boeck

Southwest Idaho District Medical Society held its semi-annual meeting at Boise, May 9. Part of the program was devoted to clinics in Boise hospitals. The scientific session was held at the United States Veterans' Hospital.

Among the guest speakers was Dr. Brien T. King, Seattle, Wash., who discussed "The Clinical History of Toxic Goiter." Dr. George C. Miller, also of Seattle, spoke on "Vascular Diseases of the Extremities." Dr. H. B. Kertley, Salt Lake City, Utah, read a paper on "Edometritis." "The Medical Management of Gastric Ulcer" was discussed by Dr. G. C. Richards, Salt Lake, while Dr. L. R. Quilliam of the United States Veterans' Hospital at Boise dealt with the subject of "Neurosyphilis." A banquet at the Elks' Club was held at the close of the meeting.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Physical Diagnosis. By Charles Phillips Emerson, A. B., M.D., Professor of Medicine, Indiana University School of Medicine. Author of Clinical Diagnosis. Cloth, 551 pp. 324 Illustrations, $7.00. J. B. Lippincott Co., Philadelphia and London, 1928.

This is a wholly new textbook on physical diagnosis. It embraces considerably more than one usually finds in such works in that it treats of many surgical conditions, or those included under this head, because they are external lesions. For example, the dermatoses, scars, warts, moles, carcinoma, leprosy and blastomycosis. Also all the external diseases of the head, scalp, face, eyelids, eyes, ears, mouth, tongue, tonsils, neck and thyroid gland are described. Then, in relation to the extremities every sort of morbid condition is delineated, many of which are usually to be found only in special works, such as flat-foot, club-foot, dislocations, fractures and skin lesions. No general account of nervous diseases is to be found other than those indicated by gaits, altered sensations, reflexes, tremors, spasticity, choreiform movements, paralyses, atrophy, etc. Diagnosis by means of examination of the blood, gastric contents, spinal fluid and urine is not considered.

The general scheme of the book is embraced in the description, first, of the body surface as a whole. Next in order follows the consideration of disorders and lesions of the head and neck, of the spine and thorax, including diseases of the heart, lungs and aorta, and finally of the abdomen and pelvis, and of the organs contained therein. The book closes with a description of the diseases of the extremities both superficial and those dependent upon injuries, infections, nervous disorders and general conditions. The work is arranged in categoric order in reference to an anatomic part. There are well marked headings over each subject. Thus one sees such a title as "The Lips," in bold type, and under this one finds all the lesions of the lips described from eczema to carcinoma, and often illustrated as well. This renders the work very convenient for ready reference.

The book is somewhat disappointing to internists as it is devoted to elucidating signs rather than symptoms, and it is impossible to present a clear clinical picture of disease by signs alone. Moreover, in the case of many most important and common diseases the description is wholly inadequate to the consequence of the subject. For instance, under acute lobar pneumonia there is an extended and sufficient account of this disorder but under bronchopneumonia, which is now-a-days so much more frequent, the diagnostic signs given are very vague. We read that these are: "Limited respiratory movements, slight impairment of resonance on percussion, slightly modified breath sounds with distant and very inconstant râles, in general widespread and not intense over any one area or areas, and persistent for weeks. The fact that both lungs are almost uniformly affected." In the reviewer's experience, in many hundreds of cases in the war and since, the most characteristic early sign of bronchopneumonia is a circumscribed area as large or larger than a silver dollar under one of the scapulae, in which one hears showers of moist râles on inspiration with increase of vocal resonance and some dullness on percussion. In fact, where large numbers of patients must be examined it is nearly safe to limit one's examination to this area alone. Christian was much struck by the same experience, as noted in Oxford Medicine. Also the fact that only one lung is involved is rather the rule in the onset.

The chief criticism lies, however, in giving pages of description to lobar pneumonia and but a paragraph to the much more common bronchial type. The same remarks apply to the discussion of chronic myocarditis and chronic cholecystitis. The latter is the most common form of organic digestive disorder, and the most frequent cause of all deaths in those past middle age is chronic myocardial insufficiency or what, for a better name, we call myocarditis, but in this book its description is limited to six lines and that of cholecystitis to about the same place.

Under auricular fibrillation there is no mention of pulse deficit, such an important sign of this arrhythmia. The emphasis placed on mitral insufficiency as an entity with marked signs, as cyanosis of the face, etc., seems unwarranted in view of the fact that without mitral stenosis the occurrence of mitral insufficiency appears doubtful and unlikely to lead to marked symptomatology, as pointed out forcibly by Cabot and based on autopsy findings. Under carcinoma of the head of the pancreas the presence of tumor is noted as the chief sign and early ascites as quite constant. As a rule in our experience it is usually impossible to palpate tumor and ascites is often absent throughout the whole course of the disease. Painless jaundice is the most notable presenting sign with enlargement of the liver and often of the gallbladder with emaciation.

But it is very easy to criticize isolated topics in a work of this size and importance and such criticism is of little consequence. For, as a whole, the book is a clear-cut, concise description of most diagnostic signs discovered by visualization or examination of all parts of the body from vertex to toes, and the subject is presented in a manner easy of reference and understanding, and represents an enormous amount of toil and knowledge. It is particularly useful for the general practitioner, including as it does diagnosis pertaining to both medicine and surgery. WINSLOW.

PHARMACOTHERAPEUTICS, MATERIA MEDICA AND DRUG ACTION. By Solomon Solis-Cohen, M.D., and Thomas Stotesbury Githens, M.D. 2009 pp. $15.00. D. Appleton and Company, New York and London. 1928.

Being printed on thin paper, this volume is not as large as one would expect. The first 400 pages are devoted to such general subjects as the object and scope of pharmacotherapeutics, disease and recovery, indications and contraindications, drug influence, sources, preparations and therapeutic use of drugs. Drugs of no physiologic action are thoroughly discussed in a scientific manner. The book is somewhat unusual in that it discusses a large number of drugs whose physiologic action is not well known and whose reputation is based upon clinical experiences of the past and present. In many cases the authors refrain from expressing their own opinions but simply state the reputation the drug has among certain practitioners.

This work represents more than one-quarter of a century of labor by the authors and where they express a definite opinion as to the action of a drug, one feels that the opinion has value. It is evident that no one man or group of men could express valuable opinions on the enormous number of little used drugs that are covered in this large volume. The book will be valuable for reference, since one is able to find some information on almost any therapeutic measure in the life time of any physician now living. There are undoubtedly a number of drugs that are more or less certain in their action that are occasionally of value, but the authors are likely to be criticized by some for again drawing attention to remedies that have been on the discard for many years.

The book is written in a very readable style. The less important material is in fine print and it contains much solid therapeutic advice. The authors seem rather generous in their discussions of homeopathic and eclectic methods. It is very evident that the book is the result of many years of reading and observation and, while open to the criticism of bringing to the attention of the physician many forgotten drugs of questionable action, it must be credited as being the most complete volume on the subject in the English language and the discriminating reader will not be led astray. The book deserves a place in the library of any one especially interested in therapeutics. GRISWOLD.

THE ULTRAVIOLET RAYS. Their Action on Internal and Nervous Diseases and Use in Preventing Loss of Color and Falling of the Hair. By Arnold Lorand, M. D. (Vienna.) Physician to the Carlsbad Springs, Czecho-Slovakia. 258 pp. $2.50. F. A. Davis Company, Philadelphia, 1928.

As stated by the author, this book is intended primarily to describe those internal conditions which indicate the use of the ultraviolet rays. Years ago physicians, practicing in the French and Italian Alps, observed beneficial results in many diseased conditions among patients exposed to the sun's rays. The discovery that this was due largely to the ultraviolet rays has led to the wide use of this agency. The author describes many pathologic conditions resulting from endocrine deficiencies relieved by use of endocrine extracts, supplemented by ultraviolet rays which prevent the deterioration of the ductless glands and promote their efficiency. He describes the favorable action of quartz light in reducing high blood pressure, which results in many cases from kidney disease and affections of peripheral arteries, both of which conditions are relieved by ultraviolet rays. He emphasizes the beneficial results from this agency in checking premature old age, which frequently results from thyroid, ovarian and pituitary deficiency, all of which are checked by ultraviolet rays. Half of the volume is devoted to the treatment of growing and falling hair. Much space is devoted to the internal causes of these conditions, which are often relieved by these agencies. Its application locally stimulates the growth of hair on any part of the body. Its application to the scalp is considered in much detail with explanations of its results. This volume is an interesting dissertation on ultraviolet therapeusis from one who has employed it extensively and with many observations.

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NORTHWEST MEDICINE

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ORIGINAL CONTRIBUTIONS

PELLAGRA

A STUDY OF THIRTY-FOUR CASES IN LOCALITIES WHERE PELLAGRA IS NOT ENDEMIC

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From the opinions of various observers, particularly those from the southern states, it would seem that cases of pellagra have been encountered more frequently during the last year than at any time since 1917. To those living in the southern part of the Mississippi Valley the recent flood disaster has been offered as a cause of this increase. In my experience, there has likewise been a decided increase in the number of cases seen during the year 1927. The deprivations attendant on the flood have, however, not been factors in the increase in our cases, since the patients have lived outside the flooded zone. The patients included in this report have been residents of the north central or northwestern part of the United States except three from the western provinces of Canada.

Within the last four years thirty-four cases of pellagra have been observed in the Mayo Clinic, sixteen of which were seen during the last year. Of this number, eight were of the primary or "idiopathic" type, while ten were of the so-called secondary type; in the remaining sixteen the diet had been decidedly deficient previous to the onset of the symptoms of pellagra. Conclusive deductions as to the etiology of pellagra are not possible from this study, but it seems clear that the clinical syndrome called pellagra may be attributed to various factors of which dietetic deficiency is the outstanding one.

Rolph, in 1916, and Bryan, in 1919, reported the first examples of secondary pellagra. In 1925, Bender again called attention to secondary pellagra and I reported five similar cases in 1926. Klauder and Winkelman in 1927, reported a series of cases in which pellagra followed alcoholic debauches. The patients were of the poorer classes and had been drinking alcohol of poor grade. In my experience with alcoholic pellagra, the patients had drunk "canned heat" or other impure forms of alcohol.

It was because of the increase in the number of patients who were inhabitants of the Northwest and particularly because more patients with the secondary type of the disease are being recognized, that this review was undertaken.

CLASSIFICATION

The cases have been classified into six groups, as follows: Group 1, idiopathic pellagra, in which dietetic and other causes are not demonstrable; group 2, dietetic pellagra, in which a diet deficient in vitamines is voluntarily adopted by the patient; group 3, secondary type, in which are included cases in which mechanical obstruction of the gastrointestinal tract is demonstrable; group 4, alcoholic pellagra, in which pellagra follows a debauch; group 5, pellagra in the insane, and group 6, pellagra sine pellagra, in which, although the constitutional signs of the disease are present, the dermatologic signs are absent.

The clinical syndrome in all groups (except in group 6) is similar and the classification is based, as the titles suggest, on the existing factors which have aided in the production of the disease.

Group 1 represents the least common type in the series, the idiopathic. In it may be classified the cases in which the syndrome of pellagra develops, while the diet is well balanced and contains the average quantity of vitamines; no causative agent is therefore demonstrable. It is in this group that the possibility of some causative factor other than dietetic deficiency is suggested. To the proponents of the infectious theory of the disease this group affords supportive evidence. In my experience with this group, a diet with a high concentration of vitamines will not always tide the patient over the present attack or help materially in preventing recurrence. In this group may be classed the cases in which more than one member of a family manifests the symptoms of the disease while on a liberal and well balanced diet. The adherents of Goldberger's conception, that dietetic deficiency is the only cause of the disease, find this group difficult to explain.

Group 2 represents a not uncommon form of pellagra, comprising about one-half of the cases in this series. In it are those patients who wilfully partake of an unbalanced diet which contains insufficient amounts of vitamines. In elderly persons who voluntarily confine their diet to carbohydrates, this form of the disease is not uncommon. Pellagra has developed in patients who adopted a carbohydrate diet following upper abdominal operations and also in others who, in a misguided effort to get thin or because of acne vulgaris or for some similar reason, limited themselves to a diet deficient in proteins. The symptoms in this type of the disease are less severe. The adjustment of the diet invariably results in rapid disappearance of the symptoms, with rarely a recurrence.

Group 3 includes those cases in which the syndrome of pellagra develops, following the appearance of an obstructive lesion in the gastrointestinal tract. The obstructive lesion plays essentially a mechanical role, in that it prevents the ingestion or retention of sufficient food or food containing enough vitamines. I have encountered pellagra in cases of malfunctioning gastroenteric stoma, gastric ulcer, stricture of the esophagus, and carcinoma of the stomach, bowel and esophagus. Elliott has recently reported a case of carcinoma of the colon which led to the development of pellagra. It is, therefore, advisable to qualify the term "secondary type" by adding the site and type of the primary disease. The influence of these obstructive lesions in producing symptoms of pellagra is evidenced by the rapid disappearance of the signs of the disease, following the surgical removal or relief of the obstruction. As a rule, these patients are so ill that operative interference is attended with a high mortality.

Group 4 contains the cases belonging essentially to the secondary type of the disease because the continued use of alcohol for a period of several weeks leads to a gastrointestinal upset and loss of appetite. A debauch for many weeks or months with eventual semistarvation characterizes the history usually obtained from this type of patient. If not too far advanced, the symptoms frequently disappear when the alcohol is replaced by a well-balanced diet.

Group 5 represents a type which is seen not uncommonly in hospitals for the insane, when patients sometimes refuse to eat for prolonged periods.

Group 6, pellagra sine pellagra, represents the clinical syndrome in which the dermatologic aspects of the disease are missing. Such a diagnosis is warranted only by one well versed in the disease, in localities where it is endemic.

SYMPTOMS

Dermatitis. In the cases in this series the dermatitis has not been so extensive or violent as that usually observed in pellagrous communities. The distribution of the dermatitis is as characteristic as the type of the eruption. The back of the hands, including wrists and forearms, and the anterior part of the neck, nose, chin, forehead and ankles, are the points at which the dermatitis is most frequently observed. The type of the dermatitis varies with the severity of the attack and the time at which the patient is examined. In the acute phase the eruption may vary from a blotchy erythema to extensive bulbous lesions with associated edema, while, in the latent and receding stages, a dry, scaling and at times keratotic eruption may be seen. A residual pigmentation at the periphery of the lesions is an essential observation in the less acute forms. The well-defined limitation, particularly about the wrist and the forearm, suggesting the term "gauntlet dermatitis," as shown in figures 1 and 2, is highly characteristic of the disease. The discomfort from the dermatitis depends on the stage of the eruption and varies from being negligible to moderate distress from itching and burning. On the face and neck, the well-defined borders, the hyperkeratosis (figs. 3 and 4) and the residual pigmentation are characteristic. Secondary infection, fissuring and ulceration may be unpleasant complications.

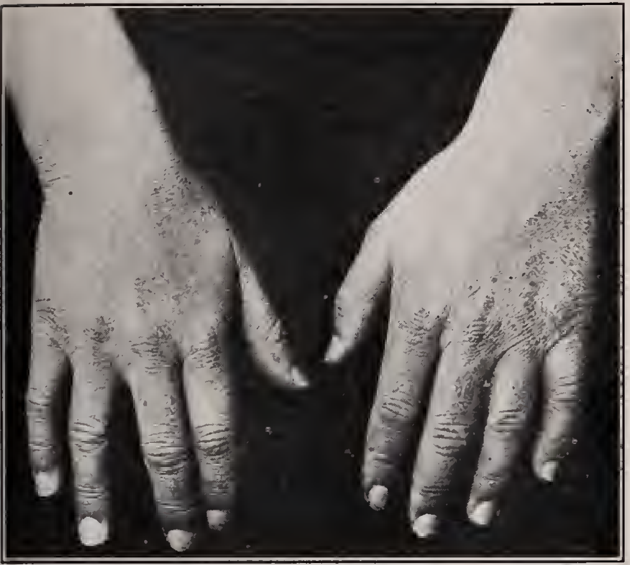

Fig. 1. The subacute type of dermatitis of pellagra. Note the well defined border above the wrist.

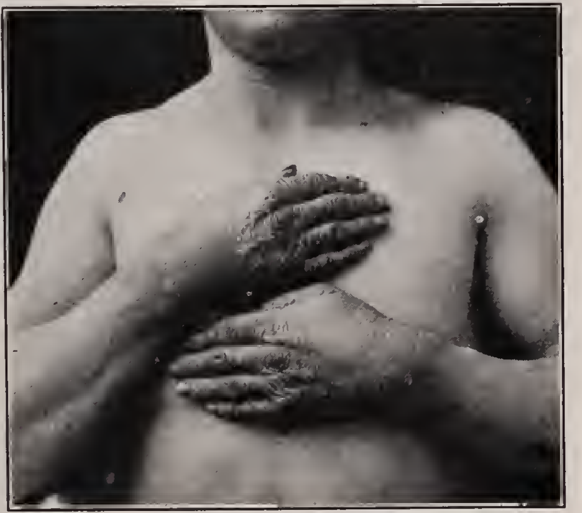

Fig. 2. A more marked type of dermatitis. The limitation of the lesion and the hyperkeratosis are readily seen. The residual pigmentation is also seen.

Diarrhea. Dermatitis may precede or follow the onset of diarrhea. In rare instances, constipation is noted. Other than its persistence, there is nothing characteristic about the diarrhea.

Simultaneously with the appearance of the diarrhea and the dermatitis, the tongue may become swollen and tender. In the severe form of the disease, ulceration of the tongue and the buccal mucous membrane may be noted. In this series super-

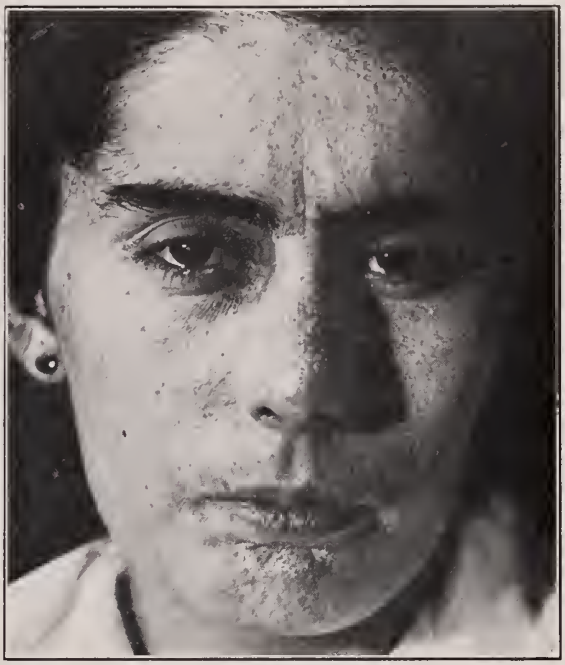

Fig. 3. The classical facies and dermatitis of pellagra. Note the keratosis on the nose and chin. This type of lesion, even in associaton with the constitutional symptoms, makes the differential diagnosis difficult between lupus erythematosis disseminatus and pellagra.

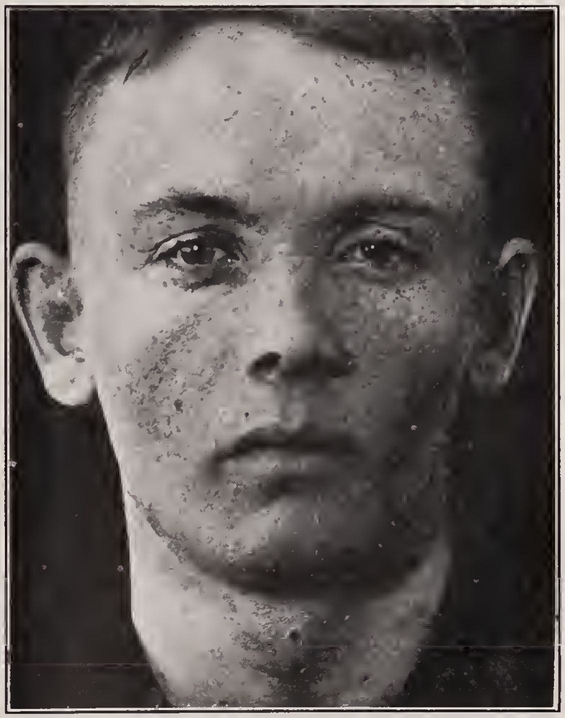

Fig. 4. The keratotic lesions in this case were well distributed over the face and forehead. The term Cassel's necklace is applied to the characteristic dermatitis on the lower part of the neck. (Not shown in photograph.)

ficial ulceration of the tongue was noted once. It is more common to find a smooth, erythematous, tender tongue, resembling closely the tongue of pernicious anemia.

Dementia. In the milder cases the neurologic symptoms vary from a mild degree of paresthesia to a clinical syndrome of combined sclerosis. Changes in personality, loss of memory and "nervous break downs" are early signs of the toxemia, while, in the more advanced types, psychosis or dementia may be noted. In the characteristic cases in this series peripheral neuritis was present.

Secondary symptoms. Associated with the signs already mentioned, a varied group of secondary symptoms are often observed. Asthenia and loss of weight are prominent and early symptoms. Persistent bronchitis, anemia, loss of appetite or refusal to eat during attacks of melancholy, muscular weakness with tenderness of the muscles on pressure, and visual complaints may accompany the varying degrees of toxemia. Delirium may be severe enough to demand physical restraint. These signs of toxemia are not paralleled by the degree of the dermatitis.

DIAGNOSIS

The recognition of pellagra is not difficult, if the three cardinal symptoms, dermatitis, diarrhea and dementia, are remembered. From the dermatological viewpoint, the differential diagnosis includes eczema, erythema multiforme, lupus erythematosus of the desseminate type, and ringworn infection of the extremity. The differential problem, however, is not difficult, if the other characteristics of pellagra are demonstrable. The dematitis is essential in the diagnosis, except in the form called pellagra sine pellagra.

ETIOLOGY

The cause of pellagra is still a subject for discussion. In the main, there are two schools of thought, one advocating the dietetic deficiency concept (Goldberger), the other that the disease is infectious. By the latter investigators numerous moulds and fungi have been suggested as the etiologic agent.

From the present study no definite deductions as to the cause of the disease can be drawn. It is apparent, however, that various agents will precipitate, in different patients, the syndrome of pellagra. The significance of obstructive lesions in the gastrointestinal tract or an alcoholic debauch, both of which interfere with the ingestion of a properly balanced diet with its adequate content of vitamines, cannot be ignored as exciting factors. This is particularly significant if the signs of pellagra disappear following the removal of the obstructing gastric or esophageal lesion, or the correction of a malfunctioning gastroenteric stoma. However, it is difficult to explain why only a small percentage of patients with obstructing lesions of this type acquire pellagra and the majority show no such syndrome. At one time, I was in accord with the suggestion of Jobling and Arnold, and thought that a monilia infection of the intestinal tract was the indirect cause of the photosensitiveness responsible for the dermatitis and that the deficient diet permitted the overgrowth of the organism. Continued observation in a larger series of cases has not confirmed this impression.

There is also the group in which no cause is demonstrable and in which dietetic treatment is frequently unsuccessful. For the present, we must admit that a high percentage of patients are cured by a diet rich in vitamines and that this percentage is higher, if the diet has been decidedly unbalanced or there has been mechanical interference with the ingestion of food.

TREATMENT

The treatment consists of eliciting and removing the exciting factor if demonstrable. Roentgenologic studies of the gastrointestinal tract will probably reveal a greater number of cases of the secondary type than has been reported. It is to be emphasized that surgical procedures in these cases are attended with a high mortality rate and, also, that the syndrome of pellagra may be precipitated, if the procedures are extensive. If there is an operable lesion of the digestive tract, efforts to readjust the diet should precede any attempt to remove the lesion. In the early cases it is often possible to eliminate the signs of pellagra by intensive dietetic measures, while in the cases of long standing, when a malignant growth is the precipitating factor, dietetic measures are usually unsuccessful and surgical attempts to relieve the obstruction are as a rule fatal. Even in the milder types of the disease, after surgical procedure has been successfully carried out, it is necessary to prepare for the toxemia or dementia of pellagra which invariably sets in two or three days after the operation. This likewise is combated by dietary measures started as soon as possible.

Outstanding results have been accomplished in those cases in which it has been possible to establish and maintain a diet high in vitamines by means of cod-liver oil, yeast, orange and lemon juice, liver, eggs, rare beef, milk or cream, green vegetables, particularly spinach, tomatoes, cabbage and lettuce, preferably uncooked. Also, following the acute attack, it is essential to furnish enough calories to maintain the body weight and sufficient bulk to obviate constipation. The use of whole-wheat bread and cereal may make up the carbohydrate deficiency. It has at times been advisable to feed the patient six meals a day.

Persistence is essential in the dietetic management. The gastrointestinal symptoms and the aversion to food demand considerable urging and even coercion. It has been my experience, also, that it is advisable to increase the vitamine content gradually, reaching the maximum in about a week. Moreover, the patient should be kept ambulatory as much as possible, while avoiding prolonged exposure to sunlight.

Internal medication has not been of much value, although arsenic and iron have been recommended enthusiastically by some authors. Bland lotions during the acute phase of the dermatitis are of value, and stimulating and mild keratolytics may be used during the latent and chronic periods. The treatment of complications is indicated as they arise. It is essential to impress on the patient the possibility of a recurrence and to urge that he maintain a diet rich in proteins and vitamines for several years.

SUMMARY

Attention is called to the fact that there has been an increase in the number of patients manifesting the syndrome of pellagra during the last year. It would seem that this increase is to be noted in the nonpellagrous belt as well as in those communities where the disease is endemic. Further attention is called to the type called secondary pellagra, and it is recommended that all clues suggesting associated gastrointestinal disease be closely investigated by complete roentgenologic and laboratory studies. Mention is also made of alcoholic pellagra, undoubtedly a type of secondary pellagra. Major surgical procedures are attended with a high mortality in cases of pellagra and special dietetic measures are essential before and after the operation.

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LARYNGEAL PARALYSIS AND THYROID SURGERY *

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It was not listening to John McCormack or the immortal Caruso, who each in his time thrilled vast audiences and amassed millions, but rather to the labored and obstructive breathing of a patient who came to us that prompted my reviewing this trite subject. Burned into my memory beyond the chance of forgetting is this woman who came to us struggling for breath and with difficulty whispering her story.

The thyroid gland had been removed, the luckless surgeon had done his work conscientiously, but through some slip, one of those rebukes we all receive to remind us that we are not infallible, the recurrent laryngeal nerves were left functionless and her vocal cords closed like the doors of a vault to be opened only by the most delicate plastic nerve surgery or probably not at all. In the face of such a disaster the surgeon searches his soul for the cause, not that the real surgeon wants to shield himself behind the recorded ill-successes of others or meanly throw the blame upon providence. He charges himself with his faults, however excusable. No insanity defense or legal makeshift can soften the relentless judgment of the jury that sits within his own mind.

Loss of voice with obstructive breathing may be due to a number of factors and conditions. Sometimes it is the result of arrangement of tissue in the early development of the thyoglossal duct, the product of the median pouch, sometimes anatomic, and lastly, what especially interests us, surgical trauma.

Naturally we would expect in mammals, where the thyroid gland is located near the larynx, that the recurrent laryngeal nerves would be exposed to injury. There are a few mammals like the hog, in whom the thyroid is located deep in the neck and this accounts for the apparent freedom from bilateral paralysis in this animal. While in the whole avian group, our domestic hens and best songbirds where the thyroid gland exists as two separate lobes on either side of the trachea, low down at the base of the bronchi, paralysis of the recurrent laryngeal nerve is unknown. This is why our best songbirds, regardless of the diseases that are common to them, seldom lose their voices, as the re-

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* Read at Meeting of Pacific Coast Surgical Association, Portland, Ore., Feb. 22, 1928.

current laryngeal nerve is not in close contact with the thyroid gland.

Many of the outstanding contributions to our knowledge of this subject have come to us from the veterinary surgeons, notably the Günthers, father and son, Professors of Surgery in Hanover Veterinary School. Their tireless efforts, experimental and clinical over a period of sixty years, stand as a monumental work in the interest of the dumb beast and should silence forever the antivivisectionists and other foes of research done in the interest of humanity. The work of the Günthers and some well known Americans, Williams, Blattenburg and Kalkus of our Pacific Northwest, has shown that man alone does not suffer from conditions that cause paralysis of the recurernt laryngeal nerve. We owe a debt of gratitude to Dr. J. W. Kalkus, of our State College of Washington, for his brilliant investigations and his efforts in assembling many new truths concerning disease of the thyroid gland and paralysis of the recurrent laryngeal nerve.

Doubtless you have heard of orchard horse disease, a condition occurring in enzootic form in irrigated apple orchard districts. This condition is due to a paralysis of the vocal cords and varies in degree in different animals. It is an unsettled etiologic question whether the arsenate of lead used in spraying fruit falls upon the alfalfa, or whether there is some form of infection peculiar to those districts. Its final study will be watched with much interest.

The horse and the dog, following attacks of so-called distemper, develop bilateral abductor paralysis of the recurrent laryngeal nerve. The hunting dog, that plays out and lags back of his master exhausted, has the same pathology in the vocal cords as the roaring horse. The condition known as roaring in the horse is nothing more than a bilateral abductor paralysis. This knowledge is helpful in convincing ourselves and occasionally a jury that complete bilateral abductor paralysis may take place without any surgical interference whatever.

Each surgeon has some scheme in mind to avoid injury to the recurrent laryngeal nerve, otherwise, like an airman doubtful of his charts, he is lost in the fog. Most of us depend on our knowledge of the normal and pathologic anatomy of the anterior of the neck. Really from a practical surgical viewpoint, the anatomy of the neck comes to the surgeon in four sealed units.

The sternocleidomastoids stand like two pilasters or columns; between the columns the ribbon muscles of the neck form a curtain wall; behind this wall is the visceral space containing the thyroid, parathyroid and recurrent laryngeal nerves, really a dynamo storage battery and wiring, and, finally, two tubes running parallel to the sternocleidomastoid muscles, containing the blood vessels and vagus, transmitting power and current.

The nerve supply is the electric wiring, making direct and indirect connections under, over and along these structures. I am fully conscious of the fact that blending of anatomy and architecture is opposed to all canons of art, but if advantage is taken of the structural scheme, the younger surgeons can offer to every patient a greater protection to voice and breathing.

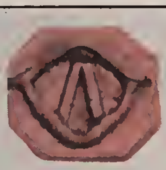
It is helpful to remember that the diffuse goiter has two envelopes separated by the extrathyroid space, while the nodular goiter is surrounded by three capsules, the thyroid fascia, the capsule proper of the goiter and the intraglandular capsule of the nodule. A hemorrhage or inflammatory exudate within any of these capsules produces pressure neuritis, depending on the region involved and the degree of tension, resulting in edema, a swelling of the tissue and later paralysis.

Years ago Seman established a truth that has not been modified one iota in half a century, when he showed that in the human and in the lower animal as well there is a marked tendency of the abductor muscles of the larynx to become affected first. Whether in the human or the lower animal, recurrent bilateral abductor paralysis will always ultimately result in midline fixation of the cord with obstructive breathing and loss of voice. Especially in the human the patient may be condemned to wear a tube for the rest of his life.

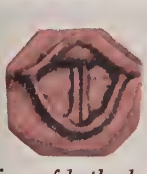
What interests the practical surgeon is this. Did the paralytic condition of the cord exist prior to the thyroid surgery or has this surgery of the thyroid been responsible for the now existing paralysis. Every general surgeon before doing thyroid surgery should examine the cords himself or have them examined for him by a competent specialist. Also he should have it well fixed in his mind that monolateral or bilateral paralysis of the recurrent laryngeal nerve may exist before any thyroid interference whatever and the patient may have an excellent voice. The pseudospecialist too often gives a favorable or unfavorable prognosis that is not consistent with the cord findings. The real surgeon wants to know and he will naturally accuse himself until he learns the true cause of the paralysis and, though it is not a crime to meet with this type of accident, it is inconvenient at least.

When he has operated, the patient has become voiceless and has obstructive breathing, the surgeon will ask himself:

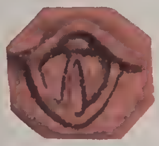
a. Does a true paralysis really exist, i.e., is there a true bilateral paralysis with permanent injury and the usual fixed midline position of the cords? This lesion is a terrible disaster. It requires repair work on the cords or some anastomosis between the recurrent laryngeal nerve and the spinal accessory or descendens noni or, as Ballance of London, England, advocates, an anastomosis of the recurrent laryngeal nerve to the phrenic nerves.



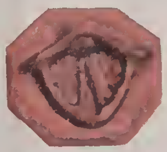
1. *Abduction of both chords in normal respiration.*



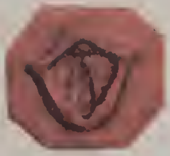
2. *Abduction of both chords as in normal phonation and in bilateral abductor paralysis.*



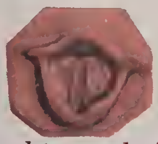
3. *Cadaveric position of both chords seen in bilateral complete recurrent paralysis.*



4 *Abductor paralysis of right chord.*



5. *Complete paralysis of left chord.*



6. *Complete paralysis of right chord. Abductor paralysis of left chord.*

Figs. 1-6. Author's scheme with hecolite plates showing positions of cords. (Drawings and readings by D. Crosby Greene, M.D., Lahey Clinic, Boston.)

b. Is it merely a temporary injury, i.e., only due to pressure and edema or a torsion injury, and the cords in a cadaveric position? Here the prognosis is favorable but experience has shown that whatever the lesion of the recurrent laryngeal nerve, there will be shown certain uniform and constant corresponding symptoms and laryngeal changes.

The vocal cords are the dials (figs. 1-6). Besides the vocal cords, the respiratory symptoms accompanying complete or partial paralysis of the recurrent laryngeal nerve correspond to the degree of injury on the same side of the chest. It is like puncturing the swim bladders of fish; it incapacitates them for measuring depth. In the human the normal depth of breathing is lost and the patient develops respiratory complications, aspiration pneumonia, really drowning in his own fluids. This is the best proof that the larynx is really a part of the respiratory apparatus.

It is helpful to the surgeon to keep before him a mental picture of the entire group of muscles that control voice. The only intrinsic laryngeal muscles supplied by the superior laryngeal nerve are the cricothyroid and part of the arytenoideus, whose function it is to pull the cord a little tighter, and the aryteniodeus muscle, whose function it is to complete the approximation holding the cord in phonation. They act like a modern belt tightener and automatic clamp. The cricothyroid muscle pulls the cord taut and the arytenoideus really puts on the clamp, holding it in place. The inferior recurrent laryngeal nerve does the rest, and supplies every other muscle of the larynx.

A knowledge of embryology is helpful to the surgeon. At least it explains why the recurrent laryngeal nerve is suspended from the trunk line of the vagus, forming a loop around the arch of the aorta on the left and around the subclavian artery on the right in order to reach its end in the muscles of the larynx which govern the voice. This is important, when you recall how immediately after birth the pulmonary circulation undergoes enormous increase and the ductus arteriosus is rapidly transformed into a fibrous cord, ligamentum arteriosum.

The surgeon must bear in mind that, when the recurrent laryngeal nerve dips down into the chest forming the long loop around the arch of the aorta on the left, it may become entangled at a point where it passes between the aorta, pulmonary artery and aortic ligaments. The outstanding example is in the case of mitral stenosis. A thyroid patient with mitral stenosis lesion, where a general anesthetic has been given, frequently develops congestion and strain upon the left heart. Here the recurrent laryngeal nerve is actually pinched between the suspensory ligament and aorta. The prognosis depends on the duration and severity of the pressure, and ability on the part of the heart to respond to appropriate treatment for the valve lesion.

It may be said the greatest factor in injury of the recurrent laryngeal nerve is in case of ligature slipping off the insecurely ligated inferior thyroid artery. The artery retracts to a point close to the recurrent laryngeal nerve and is hurriedly caught by the forceps, is pinched, crushed or the tension pulls up a loop of the nerve and it is ligated. It is not unlike the injury to the common duct in surgery of the biliary tract.

I am convinced that another region commonly overlooked and frequently exposed to danger is in the vicinity of the superior pole, especially in exophthalmic goiter. In this type of goiter the superior pole is markedly developed. There is always a segment of brittle retracheal thyroid tissue that is intertwined with the trachea and nerve.

This segment is too often left, though this part of the gland must be removed or the operation is a failure. In those past middle life and in the aged patients with arterial changes, the superior thyroid breaks off, hemorrhage follows, and in an effort to control the bleeding the nerve is crushed or injured. Again, in the case of a large cystic calcareous adenoma, that has excavated all the thyroid tissue from the side of the trachea and the recurrent laryngeal nerve is left exposed, and when the surgeon has removed the adenoma a large venous sinus is left wide open, a flood of rapid bleeding occurs and the assistant in an effort to control it grasps blindly into the field.

The hemorrhages may or may not be checked but the recurrent laryngeal nerve is injured.

Several years ago Judd, New, and Mann reported experimental study of the regeneration of this nerve and the restoration of its function after surgical trauma. They concluded that:

"1. Section of the recurrent laryngeal nerve produces complete paralysis of the vocal cord of the corresponding side, which in all probability will be permanent.

"2. Ligation of the recurrent laryngeal nerve with linen, chromic catgut or plain catgut produces complete and probably permanent paralysis of the vocal cord of the corresponding side.

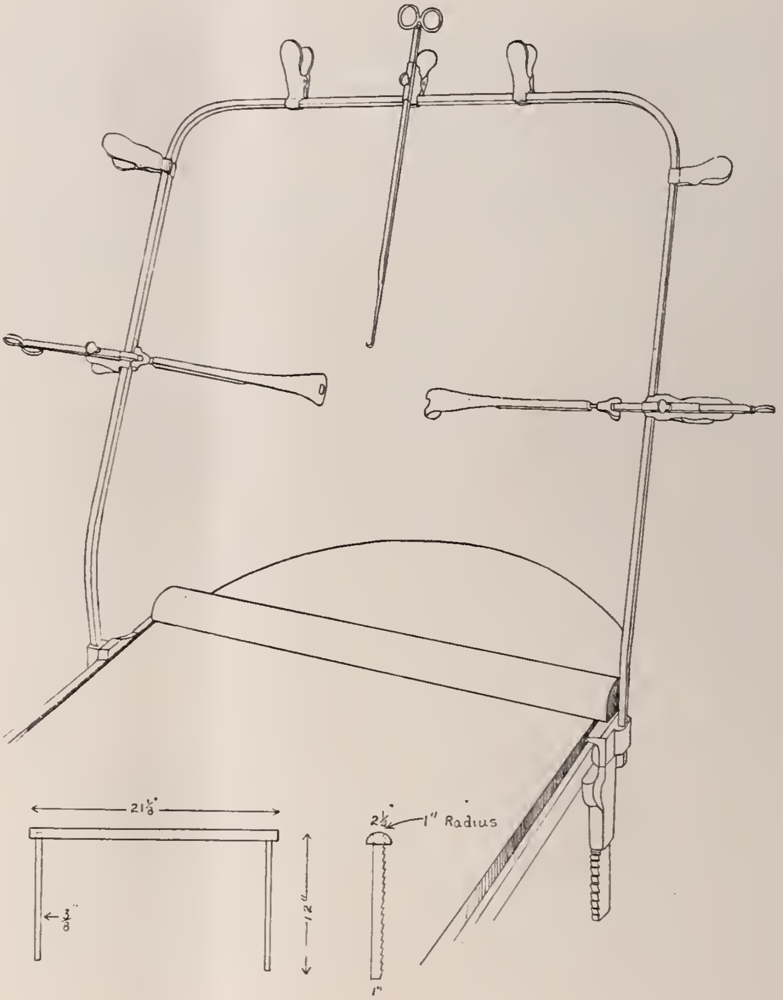


Fig. 7. Equipment for suspension technic in thyroid gland surgery.

"3. Stretching the recurrent nerves acutely in a manner similar but of longer duration and intensity than occurs in operation does not impair the function of the vocal cord.

"4. Stretching the recurrent laryngeal nerves for a long period, as over muscles, impairs the function of the vocal cords, but the impairment is probably due to the operative trauma and not to the stretching.

"5. Pinching the recurrent laryngeal nerves with

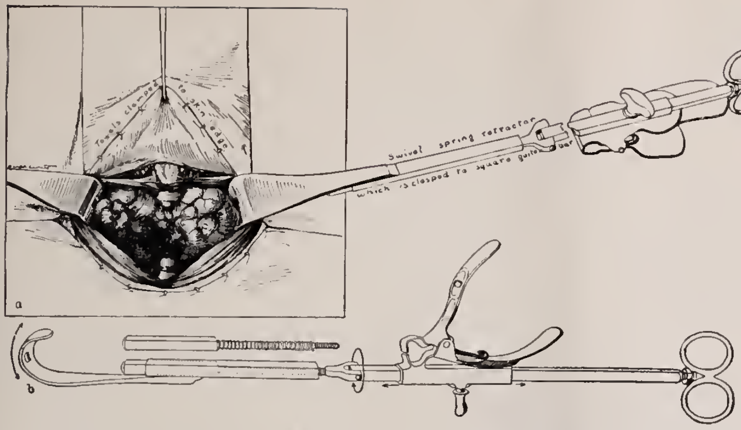

Towels clamped to skin edge
Swivel spring retractor
which is clasped to square goiter bar
a
b

Fig. 8. a, Exposure by the use of hook tenaculum and swivel spring retractors. b, Construction of swivel spring retractor.

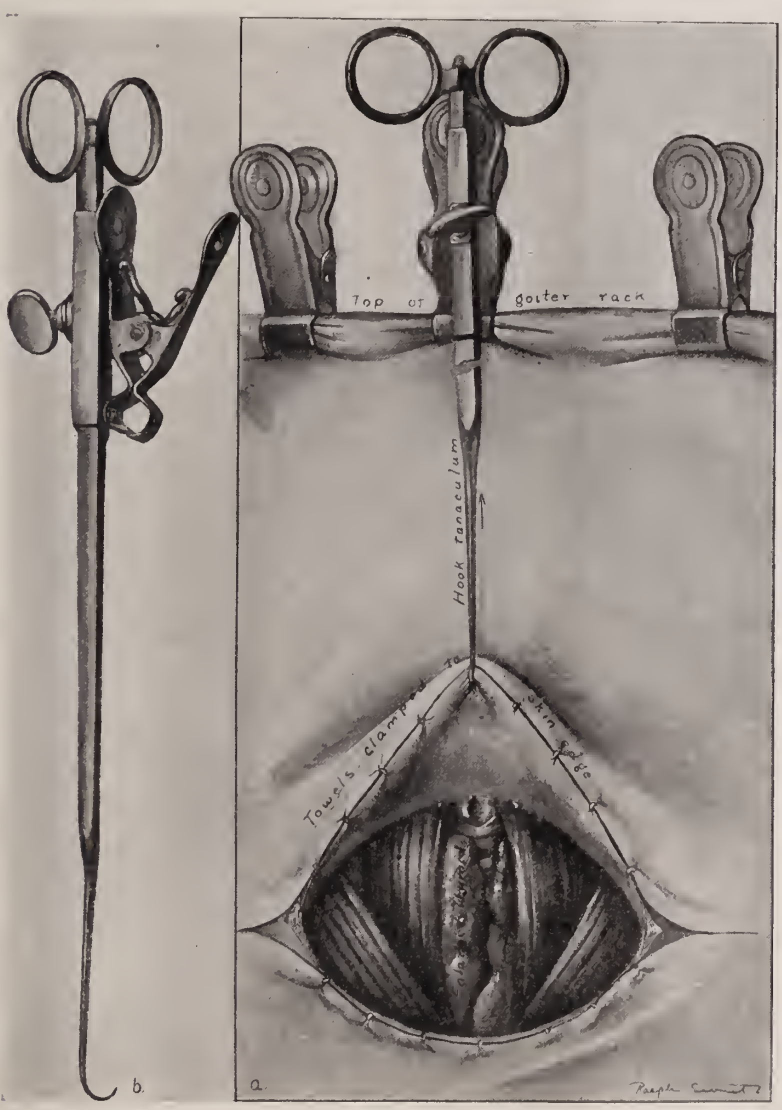


Fig. 9. a, After clamping the skin edges with towels, the upper flap is grasped with tenaculum and clamped to goiter rack by author's special clasp. b, Clip hook tenaculum.

a hemostat in a manner similar to that which may occur in an operation produces temporary paralysis of the vocal cords. Restoration of function always occurs, the length of time necessary for restoration depending on the anatomic point at which the nerve is crushed. The time found necessary for complete regeneration of the nerve, when injured in the area usually traumatized by operation, is between thirty and sixty days.

"6. Exploration of the recurrent laryngeal nerve produces an effect on the vocal cords, depending on the amount of trauma to which the nerves are subjected. Careful dissection will probably not produce any effect. The paralysis noted was probably due to pinching and other traumatic procedures."

Bartlett favors and justly recommends the principles and technic of the method introduced by Guthrie, 1918, who says, "On the right side the nerve is intimately associated with the inferior thyroid artery, passing either under or over it. On the left side it is somewhat deeply placed and less often associated with the artery. The nerve on the right side, therefore, is in more danger of being injured than the one on the left.

"To avoid the nerve the dissection should begin well up on the side of the gland and not down underneath it. The vessels are clamped as they enter the capsule of the gland, and if the nonvascular zone described by Crile is entered, it is surprising how the gland may be dissected out of its bed with little loss of blood.

"It is important always to stay well within the capsule on the gland, because the nerve lies behind it. In attacking the lower poles of the gland the forceps should be placed high up on the gland, parallel with the long axis of the neck. Judd often includes some of the gland with the vessel in this step of the operation. Any rough handling, forcible delivery of the gland or dry gauze dissection in this region should be avoided, for it is here that trauma to the nerve takes place.

“In case of severe hemorrhage, it is unwise to attempt to catch the bleeding vessels in a pool of blood. The vessels themselves should be found and clamped individually. If the gland has been resected, as Balfour advises in large colloid goiters, it is well to remember the proximity of the nerve to the lower pole and to the posterior surface of the gland and make sure that it is not caught in the lock sutures.”

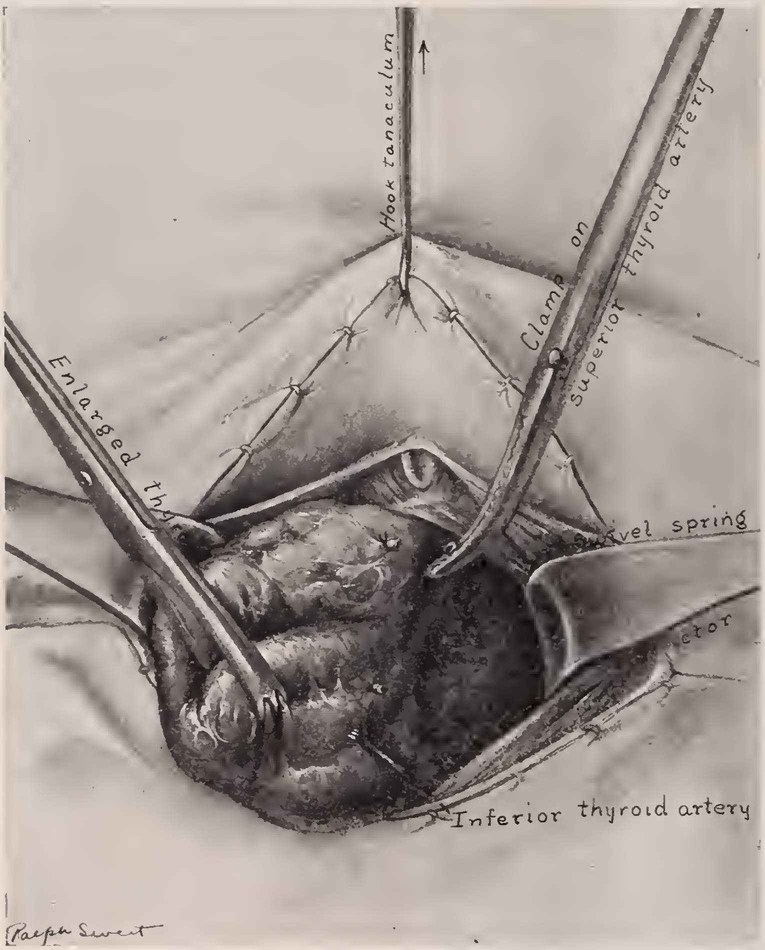


Fig. 10. Skin and platysma are hammocked as in figure 9. The author's method of retraction gives uniform exposure to the thyroid gland. The inferior thyroid artery furnishes a landmark for protection of the recurrent laryngeal nerve.

For years my brother, W. B. McNerthney, and I have used a method that we have called the suspension technic. A surgeon would feel like apologizing for so simple though practical a method, had not our best teacher, nature, from the dawn of life used suspension to protect her most delicate works, be it the product of conception in the amniotic sac, the spinal cord suspended in spinal fluid or the recurrent laryngeal nerve suspended from the main of the vagus around the aorta to the subclavian line to muscles of the larynx which it supplies. Nature certainly did her best. Everything is hung up out of harm's way, suspended.

Suspension technic differs from that with which we are all familiar only in making suspension do the work of retraction through a rack, a few clips and special tenacula which give the service of many fingers (figs. 7 and 8). Killian introduced suspension to get a better view of the interior of the throat. The bacteriologist uses this principle in obtaining a better view of bacteria in the hanging drop. With a small array of equipment the surgeon during any thyroid operation suspends everything from the towel drapes to skin and muscle flaps. The suspended superior flap itself furnishes the operator a splendid chance to inspect the wound at all times (fig. 9). A dry flap and a dry thyroid field makes it possible to view the anatomy in detail and locate and protect this important nerve supply (fig. 10).

I am sure we all recommend ligation for any bleeding vessel and there are few that can not be ligated. However, in case of rapid venous bleeding, before floundering around, injuring nerve, losing blood and finally the patient, we practice the following method. Should we get into a large vein and be unable to ligate the vessel, we immediately place in the space occupied by the gotier a corresponding sized spool of tape. The pressure and constant compression readily stop the hemorrhage. Later the tape is withdrawn from the center of the spool and the space is gradually obliterated. This method will occasionally save a voice and patient.

When the complication of bilateral abductor paralysis occurs, the patient is watched constantly and he must be told the real facts and the possible danger of obstructive breathing developing, following the least exposure to cold. The establishment of a tracheal fistula is merely an emergency measure.

1. Dilatation of the glottis with bougies gives only temporary relief.

2. Ballance of London has noted some degree of recovery of function by an anastomosis of the recurrent laryngeal to the phrenic nerve.

3. Frazier recommends end-to-end nerve suture, selecting always a nerve predominantly motor in function. The right descendens hypoglossis, both from anatomic and physiologic considerations, seems to be ideal. Stealing the nerve supply of the sternohyoid and sternothyroid muscles is not a serious crime, while taking the spinal accessory cripples the trapezius and sternocleidomastoid muscles.

4. By ventriculocordectomy, removing one cord and adjacent ventricular floors. This is the scheme that Blattenburg has worked out so ingeniously in the lower animals. He takes an ordinary dental burr with special long handle and places the burr on the outside of the vocal cord. The motion of the burr tucks or puckers up a little mucous membrane. The cicatricial tissue that follows retracts the cords from the midline and creates a breathing space. Of course, this is impractical or at least not advisable. Every human patient is entitled to multiple trials of nerve anastomosis before resorting to partial or complete destruction of the cords.

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TREATMENT OF PARATHYROID TETANY WITH COD-LIVER OIL AND YEAST*

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In some previous work favorable results were obtained by using cod-liver oil postoperatively in the treatment of parathyroid tetany in dogs.[1] With this treatment, however, anorexia was not relieved during the first few weeks following operation.

In view of a possible relationship existing between vitamin B deficiency and the anorexia of parathyroid tetany, animals after operation were given yeast and cod-liver oil in addition to their stock diet. Indications for the use of vitamin B in this work were based only upon a possible favorable effect on the anorexia.

Nine dogs were used in the experimental procedure, four of which were controls. The experimental and control animals were all kept on the regular stock diet which consisted daily of 30 c.c. of milk per kilogram body weight and 75 to 85 grams of kibbled dog cakes. In addition 250 grams of hamburger were given twice a week. After the operation five of the test animals received, in addition to this regular diet, 20 c.c. of cod-liver oil and 10 grams of Baker's yeast mixed with their kibbled cakes. The control animals received 40 c.c. of a ten per cent solution of calcium lactate daily in addition to the stock diet. One of the test animals received cod-liver oil and yeast only after calcium therapy had failed to cause compensation. Blood was drawn from the external saphenous vein or from heart puncture for serum calcium estimations which were made by the Kramer and Tisdall method, as revised by Collip and Clark.[2]

RESULTS

Tetany was delayed in onset and ameliorated in severity in the animals given cod-liver oil and yeast. The average time for the appearance of tetany in the five animals receiving cod-liver oil and yeast was 5.2 days, while for the controls it was 2.5 days.

Serum calcium dropped to the tetanic level in both the test and the control animals. In the test animals it tended to approximate the normal preoperative level after a few days, but in the controls it did not. Their use resulted in the preservation of parathyroidectomized dogs that more closely simulated the normal than when large amounts of calcium were used to prevent or to cure tetany. The anorexia, however, was not prevented by the addition of yeast to the diet.

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[2] Clark, E. P. and Collip, J. B.: Jour. Biol. Chem., LXIII, 461. 1925.

In the course of the above investigation Dr. J. Earl Else, of the department of surgery, University of Oregon, suggested the application of cod-liver oil and yeast treatment in patients showing a parathyroid deficiency. Two patients were available. Mrs. E. was taking 30 to 60 grains of calcium lactate daily and 1 c.c. of Collip's parathormone weekly. Mrs. W., whose symptoms were less severe, was receiving 15 to 30 grains of calcium lactate daily and parathormone occasionally. This therapy was insufficient to allay all symptoms of parathyroid deficiency and during the menstrual periods both took increased doses of calcium.

When these patients were started on the test treatment of cod-liver oil and yeast, parathormone and all calcium, other than that contained in the food, were stopped. The Chvostek sign was marked in both and the serum calcium was below normal.

Mrs. E. was given 4 drams of cod-liver oil b.i.d. and 5 grains of Baker's yeast t.i.d. Mrs. W. was given 4 drams of cod-liver oil daily and 5 grains of yeast b.i.d. Blood was taken for serum calcium estimations at weekly intervals until the calcium increased to practically normal.

After these two patients had been observed for over a year, two more partially lobectomized patients who developed parathyroid tetany during pregnancy were given cod-liver oil. The yeast was not included in the treatment of these patients because further experimental work with parathyroidectomized dogs showed that it apparently did not influence recovery. Only one of these patients has been receiving the cod-liver oil long enough to be included in this report. Although the other one is now progressing nicely, pregnancy and lactation will test the ability of cod-liver oil in preventing tetany.

Case 1. Mrs. E., age 36, appeared at the Portland Free Dispensary January 16, 1926, complaining of palpitation, tachycardia, nervousness, insomnia, dyspnea, goiter, cold, stiff extremities and swelling of the ankles.

Physical examination. General appearance: Patient well nourished but nervous. Palms of hands moist and warm. Thyroid enlarged with a firm nodule palpated in left lobe near isthmus. The heart was enlarged so that p.m.i. was in the sixth intercostal space in midcervical line. Systolic blood pressure was 130 and diastolic 80; pulse was 90. Laboratory findings negative.

Diagnosis: Toxic adenoma. Referred to Multnomah County Hospital for operation. She entered hospital March 8. March 17 subtotal double lobectomy. Pathologic diagnosis: Diffuse adenomatous hyperplasia with foci of increased activity.

Patient recovered well from operation and appeared quite normal until March 19, when she became restless and uncomfortable. The following afternoon she was seized with twitching of the face and carpopedal spasm. Ten c.c. of calcium chloride were given intravenously with relief of symptoms.

From March 21 to April 12, patient received 90 grains of calcium lactate daily. Because she had carpopedal spasm and a positive Chvostek sign on March 28, one gram of calcium chloride was administered intravenously in addition to the calcium lactate. From March 28 to April 12, she had no carpopedal spasm but did have a positive Chvostek in spite of vigorous calcium therapy.

When she left the hospital April 12, she was much improved and felt quite well and free from symptoms, but on April 14 she returned with an exacerbation of symptoms. The generalized clonic contractions of the muscles were relieved by the administration of one gram of calcium chloride intravenously. The following day she was given fifteen grains of calcium lactate every two hours, and on April 16 she was discharged and instructed to go to the dispensary for observation and treatment.

From April 17, 1926, to Feb. 26, 1927, patient received 30-60 grains of calcium chloride daily and from January 29 to February 19 inclusive she received one c.c. of Collip's parathyroid extract weekly.

On February 26 a sample of blood was withdrawn and serum calcium was found to be 7.86 mg. per 100 c.c. blood. She had a very pronounced Chvostek, and complained of insomnia, carpopedal spasm and tingling of hands and feet. All calcium therapy and parathyroid extract were stopped. Cod-liver oil, four drams twice a day, and Baker's yeast tablets, grains five, three times a day were prescribed. She was also advised to drink approximately two-thirds of a quart of milk daily.

On March 5 she returned to the dispensary feeling much improved. She had had some carpopedal spasm for the first two days of the week but none since. After that her Chvostek was less marked. Serum calcium was 9.50 mg.

During March 12-19 patient continued to improve. No carpopedal spasm. Serum calcium 12.0 mg. She had menstruated during the week and felt much better than usual. Muscle spasms in hands and feet were usually very severe and painful during her menstrual periods, but with cod-liver oil and yeast therapy she had felt better than at any time since operation.

March 19-26. Patient worked very hard during first three days of the week and at night noticed some muscle twitchings in upper lip. Serum calcium 12.20 mg. April 3, she was troubled with insomnia two days before onset of menstruation but had no muscle spasm. Chvostek practically normal.

April 9-23. Serum calcium 12:50 mg. Chvostek negative. Patient worked hard during week but had had no muscle spasms or insomnia. She was very optimistic. On the twenty-second serum calcium was 13.20 mg.

April 23-May 5. Patient felt well and able to work while taking cod-liver oil and yeast. On May 5 she had several abscessed teeth extracted. This caused a very severe reaction. She vomited repeatedly, took very little food and no cod-liver oil for a period of eight days. On the third day she had some muscle twitchings which were followed on the fifth to the eighth day by intermittent generalized convulsions. Her facial muscles became so spastic at times she could only swallow with difficulty. She took no cod-liver oil at this time, May 5-13, and being out of the city received no treatment. She took cod-liver oil again May 13 and on the following day she felt much improved. She had lost several pounds in weight and was still very weak. Her Chvostek was marked. May 14-July 2 much improved. Her Chvostek was mildly present.

From July 2 to time of report patient has been doing housework and feeling quite well. During the summer she only needed to take four drams of cod-liver oil daily except during menstrual periods, when she took four drams twice a day. She has observed for the past two years that she has less symptoms of tetany when out in the sunlight considerably than when in the house.

The fact that this patient had such severe tetany for eight days, when she was unable to take cod-liver oil, and the quick remission noticed when again she was able to take it, is indicative of its potent activity in mobilizing calcium for body use. Recently she attempted to go without taking the cod-liver oil and yeast for a few days, and in so doing developed a marked Chvostek, tingling and numbness of the fingers and feet as well as nervousness and irritability. When again she took her cod-liver oil and yeast regularly, she felt well.

Case 2. Mrs. W., age 45, widow. Complained of palpitation, nervousness, weakness, gastrointestinal upset and inability to walk without staggering. She had noticed these symptoms for the last four months.

Past history: General health good; influenza in 1921.

Physical examination: Thyroid showed a smooth, firm enlargement. Heart was enlarged; pulse 136 and regular. Systolic blood pressure 120 and diastolic 70. Laboratory work: March 27, b.m.r. plus 65 per cent; May 5, b.m.r. plus 79 per cent. Clinical diagnosis: Toxic hyperplastic goiter.

On March 29 both superior poles ligated. May 11 partial lobectomy. All of right lobe removed except posterior portion. Condition such that remainder of thyroidectomy delayed. May 25 margin of former scar removed. Isthmus and all of left lobe removed except posterior capsule and small amount of gland. May 28-30 patient was very restless and had a positive Chvostek sign. She was given 20 grains of calcium lactate t.i.d., and on May 30 it was increased to four times per day. May 31 it was increased to five and again diminished to four on June 6. June 12 she was discharged from hospital. July 13: She felt quite well except for some swelling of ankles and weakness in legs when standing. Chvostek present. She was advised to diminish dose of calcium lactate to 15 grains t.i.d.

Dec. 28 Chvostek positive; 1 c.c. of parathormone given. Patient had taken calcium lactate since last seen but was not entirely free of symptoms.

April 15, 1927, cod-liver oil and yeast treatment instituted. She had a fairly marked positive Chvostek and complained of insomnia because of spasms in her hands and feet. The muscles of her forehead and eyelids also twitched considerably at times and were worse during her menstrual periods.

April 18 serum calcium 9.5 mg. She felt improved. Feet and legs did not tingle and get stiff as they did when she was receiving calcium lactate. Chvostek sign was negative on the left side and weakly positive on the right.

May 14 serum calcium 9.6 mg. Patient continued to improve. Felt better than when taking calcium. May 21-July 2 serum calcium 10 mg. No disturbance of sensation.

From July 2 to time of report. With the the continued use of cod-liver oil and yeast, there have been no objective or subjective signs of parathyroid deficiency. She had no insomnia or tingling in hands and feet. She felt better in the summer when exposed to much sunlight than in the winter. Of late she has been able to go without any cod-liver oil or yeast for a few weeks at a time. When nervousness, positive Chvostek, numbness of the fingers and insomnia appear, she again takes the oil and yeast and is free of symptoms.

Case 3. Mrs. E., white, age 30, pregnant.

Present complaint: Patient entered Multnomah Hospital February 9, 1928, at 9:00 p.m. in a spastic state of tetany.

History of present complaint: She first noticed muscle cramps in the insteps of her feet in December, 1927. About six weeks ago she observed that her hands were numb and would cramp after working. Three days ago the muscles about her eyes and mouth began to twitch and tingle. She had a headache and a sensation of hyperesthesia about the cheeks and of paresthesia about the lips. Hot flashes passed over her body and she perspired profusely. Soon her arms and legs became numb and cramped. There were intermittent tetanic muscular spasms of about an hour's duration with a quiescent interval of only a few minutes. The spasmodic attacks lasted all day. The following day she was free from tetany but the next day at 5:00 p.m. an attack of tetany began which caused her to be brought to the hospital. The spasticity of her muscles was tetanic in character except for the external eye muscles and the muscles of the fingers which were clonic in character.

Past history: General health good. Operation—partial thyroidectomy August, 1927.

Physical examination: Patient well nourished. Heart normal. Systolic blood pressure 134 and diastolic 96; pulse 96; temperature 99°; respiratory rate, 24.

Extremities in painful cramps, spastic in nature. Fingers show clonic spasms; arms flexed; hands and wrists in carpopedal spasm; feet cramped. Reflexes hyperactive.

Progress record: Spastic condition was diagnosed as parathyroid tetany and 10 c.c. of a ten per cent solution of calcium chloride was given intravenously. In thirty minutes the patient appeared better, but it was an hour and fifteen minutes before she began to relax and feel comfortable.

Parathyroid tablet grains one-tenth and calcium lactate grams one, were given orally, t.i.d. until February 12, when it was changed to cod-liver oil drams four b.i.d. No more symptoms of tetany occurred and she was dismissed February 14. March 16 she was readmitted and delivered of a full term male child.

From March 16 to 19 she received no cod-liver oil. At noon of the latter day she became a little irritable and noticed a tight feeling around her eyes, and hot flashes over her face and hands. The right Chvostek was positive but not the left. In the afternoon of that day she developed a severe headache and her body temperature was 100°. The respiratory rate was 22. These are all very characteristic symptoms of oncoming tetany. (The temperature in a dog in tetany may reach 105°-108°).

The following morning her pulse was 105; temperature 99° and respiration 25. Cod-liver oil, drams four b.i.d., was given and she felt improved by evening. She has had no symptoms of tetany since taking cod-liver oil.

An estimation of blood coagulation was made by the method of Lee and White, while the patient was without cod-liver oil, and the average time for three tubes was ten minutes. Two days after the cod-liver oil treatment was instituted her blood coagulation time was normal, averaging 6.1 minutes for three tubes.

On March 26, when she was allowed to go home from the hospital, she had no objective or subjective signs of parathyroid deficiency and at present is free of symptoms.

CONCLUSIONS

1. The postoperative administration of cod-liver oil and yeast to thyroparathyroidectomized dogs delayed the onset of tetany and ameliorated its severity.

2. Anorexia could not be prevented by supplying a large amount of vitamin B in the daily diet.

3. Tetania parathyreopriva is apparently due to deranged calcium metabolism which may be controlled by administration of cod-liver oil and yeast. Dogs after receiving this diet thirty to forty days recovered and needed no further treatment.

4. Cod-liver oil and yeast therapy caused the blood calcium to return to normal and relieved the symptoms of parathyroid deficiency in two patients. Two others who developed tetany during pregnancy were relieved of all symptoms of tetany by the use of cod-liver oil alone.

MASTOIDITIS AND OTHER FOCI OF INFECTION

A CAUSE OF GASTROINTESTINAL DISTURBANCE IN CHILDREN*

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It is interesting to note that infants are considered by the laity to require special formulas suitable to the individual and not to others. It is thought that no diet is acceptable to the majority and that in most cases many foods must be tried in order to find the right one. It is for this reason, when an infant is removed from the breast and put on a bottle, that many proprietary and various types of formulas are tested. It so happens that many survive on the food offered, regardless as to whether or not it is of good quality. But there are a few who do not tolerate the new formula and so it is adjusted and changed from one type to another. It may be that the infant has previously been doing fairly well on the bottle or the breast and suddenly the diet is intolerable. Other formulas are tried with no success and the child gradually loses weight. In some cases the new diet is inadequate in calories and usually, with an adjustment whereby more calories are offered, the baby gains readily. But in a few cases it makes no difference what is given the patient, the child continues to lose.

As mentioned in the beginning, these are considered by the laity as "feeding cases" and the attempt is made to find the right food. However, one must consider this type of case from another angle. It is well known that focal infection within the body may upset the gastrointestinal system. Babies, therefore, who do not thrive when fed on a suitable adequate diet, should be studied in relation to focal infection.

An infant presents fewer possibilities of infection than an adult. In order of importance one might consider otitis media, mastoids, adenoids, sinuses, tonsils and kidneys (pyelitis). Any one of the above conditions may be the cause of the child's failure to progress. In the latter part of the nineteenth century many babies died, following severe diarrhea, intense vomiting and high temperature, when autopsied revealed no noteworthy pathology, except in those cases where the middle ear and antra were examined pus or mucopus was noted. This was considered to be a normal finding and probably existed in those infants who encountered a severe gastrointestinal disease.

In 1898 Hartmann expressed his opinion that there was some causal relationship between the infections in the mastoid antra and the digestive disturbances. Preysing, in 1904, stated that he believed the severe gastrointestinal disturbances were due to toxic substances which found their way into the blood and lymphatics, owing to the rapid absorption from the middle ear infection. In 1921 Maurice Renaud examined the mastoid antra and middle ear in seventy consecutive autopsies in infants who died from athrepsia and infantile diarrhea. Thirty had been diagnosed as otitis media during life, forty had been overlooked, the final diagnosis in most cases was infantile diarrhea. The pathologic findings were negative in these cases except for hyperplasia of the lymphoid tissue. Pus infection of the middle ear was found in all cases. In four-fifths of the cases the lesion was bilateral.

Following this, ten infants were operated upon, a bilateral posterior auricular drainage being done. None died and one made an excellent recovery. His conclusions were, "nurslings become cachetic because they are suffering from infection, not because of heredity or dyspepsia. Ears must always be examined and antrotomy done, if there is no improvement after a few days of conservative treatment. The diet question becomes secondary to the presence of an infection."

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* Read before University of Oregon Medical School Alumni Association, Portland, Ore., Jan. 12-13, 1928.

McDougal and Knauer, in 1923, reported five cases of mastoiditis in infants who were seized with the usual symptoms of prostration, lethargy and gastrointestinal upset. Three died and postmortem revealed extensive involvement of the antra and middle ears. Two lived, following a bilateral antrotomy. Byfield stated, in 1924, "after seeing three infants under two months of age die of gastroenteritis, dehydration and acidosis and finding in each of them at autopsy infected mastoid antra, drainage of this region was carried out in six other infants of this age, one being less than eighteen days old. All but one of these babies were saved, though several were in such serious condition that their survival was not looked for.

Floyd, in 1925, reported twenty-six cases and concluded that a bilateral mastoidectomy is indicated as soon as the condition is determined. Marriott, in 1925, stated that the hydrolatility and gastrointestinal symptoms are the result of a specific intoxication rather than of fever itself. Infants suffering from mastoids infected by pneumococcus and staphylococcus do not exhibit these symptoms. He believes that the symptoms are the result of a streptococcus toxin that finds its way to the capillaries of the intestines causing them damage.

Alden and Lyman reported fifteen operated cases, in 1926, from two to fourteen months, the majority being between three to seven months. Eight recovered and seven died. Hemolytic streptococci was found in eleven cases, pneumococcus in one; three were not noted.

In a recent article Dean M. Lierle of Iowa City reports one hundred cases of mastoiditis in infants. Lyman reported forty-three cases which had mastoid operations between October 23, 1926, and April 20, 1927, in St. Louis Children's Hospital, all of whom were under two years of age. Of these cases, thirty presented marked gastrointestinal symptoms with eight deaths, and thirteen did not present any gastrointestinal symptoms with one death. These figures show forcibly that in infants mastoid infections with gastrointestinal symptoms are much more serious than those without, and that prompt and thorough operation is much more important in these cases than in the usual mastoid abscess.

The question of sinuses and loss of weight in infants is not so frequent as mastoid and ear infections, though it must be considered and ruled out as shown by case 8. It is usually the ear or the mastoid that is overlooked, probably because of the difficulty in viewing an infant's ear and the lack of suspicion.

In review of the history one can note that the subject of mastoids, ear infection and sinuses as a casual relationship to a severe gastrointestinal disease is comparatively new. It is for this purpose I wish to present ten cases which we have had in the past year.

Most of the cases of otitis media and mastoiditis in infants occur in those under one year of age, though they may be present in older children. There is a great predisposition of poorly nourished or premature infants. Breast fed babies are not so liable to infection as those artificially fed.

The causative organism from fifty-nine mastoids, representing thirty-two cases as cultured by Mary Spahr, M.D., St. Louis Children's Hospital, is as follows:

	Number	Cases	Pure Culture
Hemolytic streptococci	22	13	21
Pneumococcus	12	8	9
Staphylococcus	10	7	5
Diphtheroid	9	7	1
Bacillus coli	4	3	3
Micrococcus catarrhalis	1	1	
No growth	3	2	

In only seven cases was the same organism recovered from the ear.

At birth the antrum, attic and upper portion of the middle ear are filled with mesodermal connective tissue, which as the child grows becomes gradually absorbed and thinned out. In infant life there is so much embryonal connective tissue remaining in the attic and antrum that it requires only the slightest irritation to cause swelling enough to entirely separate these cavities from the middle ear. The tympanic annulus in its superior portion is incomplete. Any accumulation of fluid in the antrum will show as a bulge downward from the membranous floor of the antrum, at upper wall of the external auditory canal.

Prentiss states that there is a space in the tympanum between the malleus and the incus in an infant which may be closed off from the remaining part of the tympanum so that when a myringotomy is done there still remains pus in the epitympanic space. Dean states that, though there may be attic suppuration, the remaining portion of the tympanum may be negative.

The symptoms of these cases vary according to the infecting organisms. There may be a few days of coryza or throat infection, accompanied by a mild cough. The case may be ushered in with marked symptoms of "cholera morbus," high temperature, vomiting, inability to take food, many stools a day (eighteen to forty), rapid dehydration, prostration, lethargy, coma, death. Symptoms may occur during a period of from one to four days. This type is represented by case 7. In others there is no increased temperature, no vomiting or diarrhea, nothing except that the child fails to gain on the prescribed adequate diet. This is represented by case 7.

There are two types of cases which mark the extremes, and variations of either one may occur. The temperature in the severe cases remains high, whereas in the mild type no fever may be noted. The diarrhea that accompanies the cholera morbus type consists of a very watery stool with mucus. These are more liquid when parenteral fluid is being given. Also in this type the prostration is severe. The babies appear grey, due to the concentrated blood (loss of fluids); the eyes are sunken and glassy. The respirations are rapid (acidotic). In the early part of the disease the child is very restless, tossing from one side to the other. The final evidence is offered by examination of the ears.

One experienced in viewing infants' ear drums has little trouble in finding definite pathology. This is best accomplished by the use of an electric otoscope, using an infant speculum. The ear canal must be thoroughly cleaned of wax so as to afford a free view of the entire wall and the visible portion of the drum. Drums will vary according to the infecting organism and according to the duration of the disease. Many will be distinctly reddened, with a marked loss of lustre and light reflex. In others the drum may be peculiarly thickened and greyish. In many it will be entirely negative, the lustre will be good, the light reflex present, with no evidence of thickening and when opened will crackle and liberate no fluid.

In these and in all cases the posterior wall, especially over that portion where the tympanic annulus is incomplete, must be carefully studied. One should look carefully for a sag in the superior or posterior superior wall (Alden) of the auditory canal just external to the tympanic membrane. In Lierle's opinion there is no case of otitis media or mastoiditis present without some change in the drumhead or canal wall. Rarely in these cases is there any mastoid swelling. Tenderness is present possibly, but it is difficult to determine with surety. A leucocytosis is usually present, running up in some cases to 25,000. The blood chlorides are diminished, the n. p. n. is increased, acetone is increased in the blood and urine.

Given a baby who is not doing well on the prescribed diet or one who presents the marked symptoms of cholera morbus, the diagnosis of otitis media or mastoiditis is made first by ruling out any other foci of infection and, second, by noting the pathology of the ear drums and canal wall. If in doubt a simple myringotomy will often aid, but it must be remembered that it is possible to open an ear drum in the lower quadrant and secure no pus whereas, if Shrapnell's membrane or the posterior wall is incised, pus might be found.

The line of treatment and the question of operative interference depend entirely upon the case. Given a case of cholera morbus, there is only one thing to do after the child has been properly prepared by transfusion and parenteral fluids, that is, an antrotomy. An antrotomy or mastoidectomy is comparatively a simple procedure in an infant. Usually there is only one large mastoid cell or antrum, though in several infants extracells have been noted. Merely an opening into the mastoid antra is sufficient. In a case where the symptoms are not marked the ears may be opened freely and the case followed carefully for a few days to determine whether or not the drainage will be adequate through the ear canal.

CASE HISTORIES

1. Busby, age four months. Child in extreme condition, temperature 104° for two or three days, frequent loose, watery stools, unable to retain food. Baby previously breast fed and was doing very well until onset of present illness. Physical examination negative except for thickened ear drums, bulging slightly, distinct loss of lustre, marked sag in posterior wall. Paracentesis followed by a liberal discharge of serosanguineous fluid. Sent to hospital and operated on forty-eight hours later. Definite pus was found in both mastoids. Cultured, streptococcus hemolyticus. Patient died from septicemia.

2. Potter, age three months, sick for three weeks with temperature and severe cough. Child very much dehydrated and slightly cyanotic. Physical examination revealed a marked bronchitis with no evidence of pneumonia. Both ears were distinctly grey and bulging in the posterior superior wall. Bilateral paracentesis was done, followed by a liberal discharge of frank pus. Child improved somewhat. Bilateral antrotomy was done five days later. Patient improved for four days, then became acutely ill. Physical examination revealed a frank pneumonia. He died two days later.

3. Joan, four months, taken ill suddenly with a temperature of 104°. Physical examination revealed evidence of right upper lobar pneumonia. Both ear drums were hyperemic and distinctly bulging. A sag in the posterior wall was evident. In spite of the pneumonia a bilateral antrotomy was done; frank pus was noted in both antra. Following this the child made an excellent recovery.

4. Mildred Kearneg, age two months, from Waverly Baby Home. This infant during the first month

gained regularly. At five to six weeks she started to run a temperature of 101°. Weight commenced gradually to drop and the stools became more frequent and watery. Physical examination done repeatedly revealed no pathology, though the ear drums were repeatedly examined. The usual dietary plan of cutting down on the sugars and increasing protein to check the diarrhea did not alter the condition.

During a period of two weeks the infant was repeatedly examined with hope of locating a hidden foci. About two weeks following the onset of the illness both ear drums were considered suspicious. Three days later both ear drums were opened with a liberal discharge of serosanguineous fluid. Following this the baby improved somewhat for a few days and then again the weight dropped rapidly.

About sixteen to eighteen days following the onset of the illness a bilateral antrotomy was done. The child at the time of operation weighed 100 grams less than the entrance weight into the baby home. Following the operation the temperature gradually dropped to normal and the weight gradually increased. The infant gained over a pound in the next ten days and the stools were normal.

5. A twelve-pound baby at birth. Child was first seen at the office at the age of three months, weighing seven pounds and two ounces. The infant was moribund, breathing irregular, eyes sunken and glassy. A definite history of pyloric stenosis was obtained.

He was prepared for operation. A large pyloric tumor was found and a Ramstedt was done. Following the operation the infant continued to lose and vomit. No diarrhea noted, temperature 100°. He was examined and found to have grey ear drums with distinct sag in posterior wall. Paracentesis was done, followed by a liberal discharge of pus. At this time a bilateral antrotomy was considered but postponed. In the three days following the child improved so much that antrotomy was not done. Both ears drained freely, though it was necessary to do repeated myringotomies. He was seen at five months; weighed over thirteen pounds and ears were normal.

6. Birth weight seven pounds. Lost to five pounds four ounces in first week of life. First seen at two weeks, temperature normal. Complaint of not taking food, crying a good deal, losing weight. Placed on supplementary feeding. Eleven days later (twenty-five days old) weight was five pounds six ounces, temperature normal, white blood count 24,000.

Physical examination negative except that both ear drums were distinctly grey with marked loss of lustre. Both posterior superior walls were distinctly bulging. Myringotomy followed by frank pus. Child gained to six pounds four ounces at four weeks but repeated myringotomies were necessary. During the fifth week the baby did very poorly. weight stationary, vomiting, crying considerably, and having severe sinking spells. Ear drums again were sealed over. In view of the necessity of repeated myringotomies a bilateral antrotomy was done, following which he gained one pound and nine ounces in twenty-one days. Since then the child has gained regularly and when seen at eight months was above the normal weight.

7. Virtt, age four months, weight ten pounds fourteen ounces. Entered Doernbecker Hospital for Children on October 10, 1927. Complaint, diarrhea one week, stools greenish and foul smelling, vomited considerably. The child was moribund, greyish pallor and very listless. Transfused and given saline.

Physical examinations was negative except for suspicious ear drum, which when opened liberated nothing. In spite of the negative ear drums and in view of negative physical findings, the history and extreme condition of the infant, a bilateral antrotomy was done and pus was found in both mastoids. Following the operation the baby made a remarkable recovery.

8. Patricia Consentica, age eight months, admitted from St. Agnes Baby Home to Doernbecker Hospital for Children on July 11, 1927. Complaint, child had not gained for past six weeks. Physical examination negative except for enlarged tonsils. Weight 6900 grams. Child placed on routine diet and sunlight therapy instituted. For five weeks the weight was stationary and the baby seemed about the same except for an occasional rise in temperature.

On August 25, over six weeks from entrance and three months approximately the same weight, the possibility of infection of tonsils, adenoids and sinuses (antra) was suspected. On August 27 a tonsilectomy and adenoidectomy were done. Both antra were irrigated, following which the child gained twenty ounces in three weeks. She was then sent back to the baby home and gained regularly.

9. Infant, three weeks old, weight seven pounds two ounces. Complaint, not gaining (breast fed with dryco supplementary feeding), cries considerably. Four to five stools daily. Physical examination negative. Placed on adequate supplementary feeding. Child returned one week later. Weight seven pounds three and one-half ounces. Gained one and one-half ounces. Still very cranky and irritable.

Left ear running a little bit. It was examined carefully, showing marked bulge in the posterior superior wall, slight amount of pus in the external auditory meatus. A large incision made in the drum was followed by a marked purulent discharge. Child returned one week later, had gained one and one-half pounds. Ear had drained profusely for three days and then stopped. The baby had since gained regularly.

10. A ten day old infant seen in the nursery of the hospital, breast fed, weight five pounds eight ounces. Complaint, temperature 104°, losing weight. Vomits, will not take the breast, slight diarrhea. General physical examination negative except for marked bulging in both posterior superior walls of the ears, with active inflammation of the wall and posterior drum. Myringotomy followed by pus and blood. Temperature dropped to normal. The following day myringotomy was done to maintain drainage. Infant gained in weight, was able to take the breast and two weeks later was reported to be doing very well.

CONCLUSIONS

1. Infants that fail to gain on an adequate proper diet should be carefully studied for focal infection.

2. Otitis media, mastoiditis, sinusitis must be considered as possible cause in loss of weight.

3. Infants presenting symptoms of marked diarrhea, rapid loss in weight, vomiting, high temperature should have a careful nose and ear examination.

4. In presence of a negative physical and suggestive ear drums, an infant with marked cholera morbus symptoms should have an antrotomy.

5. In presence of mild gastrointestinal disturbance myringotomies should be done, but if drainage

is inadequate and infant does not respond, an antrotomy is indicated.

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THE VALUE OF CHOLECYSTOGRAPHY

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This clinic has been examining the function of the gallbladder by the method of dye administration and subsequent roentgenologic examinations for a period in excess of two and a half years. During this period, until about two months ago, the technic for the oral administration of the dye, as worked out by Drs. Whitaker, Milliken and Vogt at Harvard Medical School and the Peter Bent Brigham Hospital, has been followed. It was at no time felt that the intravenous administration of the dye, on account of the severity of the reactions reported in the early work, should be used because the patients had to be ambulatory during their clinical examination, so there consequently are no data on this angle of the work. Since the early part of February, as a result of this study, we have changed the technic and have adopted in principle the technic as brought out by Drs. Levyn and Aaron of Buffalo and reported in the *American Journal of Roentgenology and Radium Therapy* for December, 1927.

The reaction here to the whole matter of cholecystography, as originated by Graham and Cole at Washington University Medical School and Barnes Hospital, St. Louis, has been that this test was a marked advance in the matter of gallbladder diagnosis. However, it was felt that the test, as with so many new things in medicine, would be of most value only when the procedure had been used by a large number of different organizations, their results reported and pooled, the whole procedure checked and standardized. It has been thought best to rely chiefly on the usual clinical history and examination and to use the test as merely corroborating evidence, glad when its evidence coincided with the other findings and often disregarding it when it did not.

It was felt that, if too much reliance were placed on the cholecystographic findings and all gallbladders which failed to fill were considered diseased and that such organs were removed, too many unnecessary operations would be performed and too many normal gallbladders explored. This study of the records has justified this caution. It had about been concluded that the test, as carried out here, was of very questionable value. However, since adopting the new technic, the results as indicated by the first fifty cases here reported are much more encouraging. While it is too early to come to any final conclusions, it is believed that patients, who with this new technic show abnormal response to the dye administration, are carrying diseased gallbladders, livers or ducts.

The old technic, which has been discarded as being unreliable and as causing too many and severe reactions, i.e., nausea, vomiting, and diarrhea, was briefly as follows: The enteric coated pills of sodium tetraiodophenolphthalein, as specially prepared for the Peter Bent Brigham Hospital, were used. One five grain pill for every ten pounds of body weight was given. The instructions were for the patients to take a light supper without meat at 6 p.m. At 8 p.m. they went to bed and rested on the right side. Starting at 8 p.m. they took four pills with half a glass of water every half hour until all were taken, and remained on the right side for half an hour after the last pills were taken.

The next morning they reported at the x-ray department without eating or drinking. The usual three plates were taken, twelve, fifteen and seventeen hours after the pills had been taken, the last plate bing preceded by a meal rich in fats. The results with this method, comprising 499 examinations, are tabulated below.

	Normal Filling	Operated Upon	Biliary Path. Found	Abnormal Filling	Operated Upon	No Biliary Path Found
1st 50	27	0	0	23	7	1
2nd 50	30	2	0	20	4	2
3rd 50	25	7	0	25	5	2
4th 50	23	3	3	27	10	2
5th 50	23	1	1	27	7	1
6th 50	33	4	2	17	3	0
7th 50	26	5	0	24	7	1
8th 50	25	4	1	25	11	3
9th 50	30	5	0	20	8	2
10th 49	30	2	0	19	4	1
Totals	272	33	7	277	66	15
1st 50 by new method	41	2	1	9	3	0

Summarizing the above results, we find that 272 patients out of 499 showed a normal gallbladder filling and decreased in size following the fat meal. Only slightly less than 54 per cent of the gallbladders examined were normal to the Cole-Graham test. Conversely, 46 per cent of those examined were positive for disease, that is, showed abnormal filling. This would suggest, if the test were accepted as certain evidence, that these gallbladders were diseased and should be removed.

Of this group of 499 cases, 99 came to operation, nearly 20 per cent. Sixty-six of the 227 cases who showed abnormal gallbladder filling came to operation. This is 13 per cent of the total examined, as contrasted to the 46 per cent in whom the test indicated disease. All of these cases, however, were not operated upon for gallbladder disease but nevertheless they serve as a check on the test. The same is true of the 33 cases who came to operation from the group showing normal gallbladders by the Cole-Graham test. The findings in these operated cases, which were contrary to what should have been expected by the results of the test, will be summarized later.

For the present there is food for thought in the fact that out of the 66 cases who were operated upon, who had positive Cole-Graham tests, disregarding the preoperative diagnosis, 15 or 22 per cent showed no biliary pathology to account for the cholecystographic findings. Likewise, in seven of the 33 Cole-Graham negative cases explored, definite biliary tract disease was found, an error in this instance of 20 per cent.

Thus, here is a test, using the technic previously described, with a proved accuracy of not quite 80 per cent in operated cases. The error in the unoperated cases was probably even greater, for it cannot be that 46 per cent of the cases examined actually had diseased biliary tracts, as would be the case if the test was 100 per cent accurate. It is interesting to note that Whitaker, Milliken, and Vogt reported 65 per cent showing shadows in the group of patients with probable biliary disease, while this series had filling in only 56 per cent of all cases.

The seven operated cases that had normal filling of the gallbladder but disease at operation showed the following pathology. One was acutely inflamed and had stones. Three had thickened, white, chronically inflamed gallbladders without adhesions. The other three had adhesions in varying degrees in addition to the chronic cholecystitis. This comprises an interesting group of cases. It was felt that a diseased gallbladder would show some abnormality of filling. In view of these cases, either there has been an error of interpretation of the plates or else some diseased gallbladders must retain a good deal of function.

The group of cases which had positive Cole-Graham tests but normal gallbladders at operation, numbering 15 in all, probably represent direct technical failures of the old technic. Any oral method using enteric coated pills of the dye has the hazard of imperfect absorption from the intestinal tract. There is no way of being sure that the pills, once they reach the intestines, will dissolve and form a solution of the salt, which form is necessary for the absorption of the dye. The salt must be in solution.

Of these 15 cases only one showed any filling and that case failed to diminish in size following the fat meal. It proved at operation to be one of duodenal ulcer. There were two other cases which proved to have duodenal ulcers. Six of these cases were suffering from various degrees and types of visceroptosis. Two showed appendicitis; one a ventral hernia; one a retroverted uterus; one a polyposis of the colon; one a diverticulitis of the sigmoid; and in one case there was no demonstrable pathology. This group represents a real failure of the technic and the indications are that it will be greatly reduced if not eliminated by the new technic.

There are one or two other facts which are interesting as a matter of record. In this group of cases there were six with a filling of the gallbladder and a decrease in size after the meal, but which by mottled and negative shadows were diagnosed definitely as cholelithiasis. Two of these were operated upon and both confirmed the preoperative findings. One had a stone in the cystic duct as well as the gallbladder.

There were eleven cases that failed to show any decrease in size after the meal. Three of these were operated upon and all three had diseased gallbladders. There were five cases who had had their gallbladders opened and drained previously and any stones present removed. None of these showed any filling by the test. Four were operated upon again and all, of course, showed definitely diseased gallbladders. The evidence seemed that drained gallbladders would fail to give a filling with the dye, but in the series with the new technic there has been one case with previous gallbladder drainage, and that had a normal filling and emptying.

Before this study was finished the conclusion was reached that the oral method using pills gave us too little assurance of the formation of a solution of the salt in the intestine, which form is necessary, if the drug is to be absorbed, and so was not a test of great value. A proved accuracy of 79 per cent and an actual accuracy of probably less than this was not enough to place much faith in the findings. It has also been our experience that the oral administration of enteric coated pills has been very and almost universally disagreeable to the patients, nausea being a most constant result and vomiting very frequent.

The technic for the oral administration of the dye has been adopted, as brought out by Levyn and Aaron of Buffalo, New York, in the *American Journal of Roentgenology and Radium Therapy* for December, 1927. This technic consists in mixing a filtered solution, containing three grams of the salt, sodium tetraiodophenolphthalein in an ounce of water with eight ounces of grape juice. This precipitates out the free acid in a very fine flocculent and insoluble form. This draught, which tastes only of grape juice, is now taken and, when it passes into the alkaline intestine (as most of it does at once), it is rapidly reconverted into the solution of the sodium salt which is the condition suitable for absorption. The roentgenograms are taken at the usual periods, 12, 15 and 17 hours p. c. with a fat meal between the last two plates. It is important that the solution of dye be made up the day it is to be taken and mixed with grape juice just before being taken. A copy of the slips used in this clinic showing detailed instructions follows.

For ....
Address ....
Date..............................
Rx
Sodium tetraiodophenolphthalein 3.
Aqu. dist. 30.
Misc.: Filtra.
Sig: Take in grape juice as directed.
..............................M.D.

DIRECTIONS FOR GRAHAM TEST
(Patient Keeps This)

1. Eat light supper, without meat, at 6 p.m.
2. Pour medicine into 8 ounces of cold grape juice and take at 9 p.m..............................night.
3. Follow with glass of water if desired.
4. Avoid entirely the sight, smell or taste of food or drink after taking medicine, until instructed to eat.
5. Avoid use of tobacco and chewing gum until test is over.
6. If convenient, retire shortly after taking medicine.
7. Report for first x-ray picture at 9 a.m.............................. morning.

After adopting this technic one is impressed with several things. First, the gallbladder shadows were sharper than any that had been secured before; second, the percentage of fillings was at once higher; third, the inconvenience to the patient was markedly decreased. This was due in part to the fact that it is much easier to take a glass full of a pleasant draught than it is to take twelve to eighteen pills in divided doses which are in themselves hard to swallow, and also to the fact that the incidence of nausea and vomiting is greatly reduced. There have been only four cases in the fifty that reported being nauseated from the dye in grape juice. There has been no vomiting. Some patients are psychically disturbed by the mixture of the colors of the dye and grape juice and also the "curdling" of the mixture. However, the free acid is tasteless and the patients should be told what to expect and so obviate this disturbance. Fourth, where with the old tichnic we used to look for a shadow in the colon as a criterion of the successful dissolution of the pills, with the new technic there is no consistent shadow of the colon. The probability is that the colonic shadow in the old technic was of pastey masses of the dye mixed with feces and not an evenly distributed solution as is secured with the new technic.

The table in the first part of the paper reports the first fifty cases done by this technic. While no definite conclusions are to be drawn from so small a number, this new technic is both scientific and practical and the results are much better than was the previous experience. It is probable now that a gallbladder that fails to show a shadow is almost certain to be diseased. However, it is too early to make this statement definitely until a much larger series of cases on which to base conclusions has been studied.

An abnormal filling of 18 per cent of the fifty cases examined by the new technic probably represents quite closely the actual incidence of gallbladder disease, and 82 per cent is about the number in which one should expect to get normal filling. Unfortunately the incidence of operation in this group of fifty cases with this technic is not great, but the four cases having no filling of the gallbladder all had biliary disease at operation. The one case with normal filling, which was operated upon on account of the definite right upper quadrant symptoms, had definite gallbladder disease with stones. This seems pretty well to establish that it is possible to have considerable gallbladder disease and still retain a normal function. There is, of course, no basis for final conclusions on so small a series of cases. The results with a larger series with the new technic will be reported at a later date.

CONCLUSIONS

1. The oral administration of pills is subject to too great a chance of error to be of much value clinically.

2. The oral administration of a fine flocculent suspension of the free acid in grape juice, as is produced when one mixes a filtered solution of the salt and grape juice, is sound, scientific, clinically practical and of but slight discomfort to the patient.

3. The results with the new technic are better in that we get sharper outlines, a higher percentage of fillings, and accuracy in proven cases.

4. A normal filling and emptying by the test does not prove a normal gallbladder.

5. We are justified in urging others to adopt this technic of Levyn and Aaron as offering nearly if not wholly the efficiency of the intravenous method as first brought out by Graham and Cole and with scarcely any of its drawbacks.

Auricular Flutter. Howard B. Sprague and Paul D. White, Boston (*Journal A. M. A.*, June 2, 1928), report a case of persistent auricular flutter lasting five years, and unchecked by digitalis or quinidine in full dosage, the flutter finally stopped abruptly for no known reason. No evidence of heart disease was discovered. Not infrequently during the course of the flutter the ventricular rate followed the auricular, without block, at from 240 to 260 beats a minute; at such times palpitation and weakness were distressing.

ANGINA PECTORIS

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Angina, derived from the Greek word ἀγχόνη a throttling, refers to a symptom-complex and not to a pathologic entity.[1] In 1768, Heberden gave this name to a malady, the pathology of which he did not know. He was esteemed as one of the finest Greek and Hebrew scholars of his time, and his description of this disease was such an outstanding literary production that the name which he gave is retained at the present time.

Following Heberden's account of the disease, Jenner and Parry connected the relationship between angina pectoris and diseased coronary arteries. Jenner, who had been a student of John Hunter and knew of his attacks of angina pectoris, conveyed this information to Parry, a country physician. These two men had the opportunity of doing autopsies on those who during life had attacks of this disease. Thus they showed that diseased coronaries were the cause of the symptoms. Since that time it has been demonstrated that the relationship between angina pectoris and diseased coronaries is not so simple as Jenner and Parry had thought it to be. So a confusion has arisen in medical literature regarding angina pectoris.

The research work of Mackenzie, Lewis and others has changed the nomenclature of certain diseases of the heart, while this name, descriptive of a symptom-complex, remains. Angina pectoris has no more right to exist as the name of a disease than does jaundice or colic. The unscientific use of this term in medical literature is fully realized by those who use it. Anders,[2] writing on the subject, says in his opening sentence: "It has been observed that about one of every twenty physicians dies of angina pectoris." In his next sentence he says, "This is not strictly speaking a disease but a symptom-complex."

Not only does the name obscure the disease which it is supposed to describe, but the relationship between angina pectoris and the coronary arteries is shrouded by obscure physiologic and pathologic conditions which will be discussed under the following headings: (1) Not every case of coronary sclerosis-narrowing causes the symptom-complex of angina pectoris. (2) Normal coronary arteries, arteries not narrowed, have been found in persons who during life gave symptoms of angina pectoris. (3) Coronary arteries sclerosed, narrowed or occluded, have caused atypical symptoms of angina pectoris.

Before bringing forth this evidence against the coronary arteries under the three headings mentioned above, it should be stated that evidence of a positive character can be brought against the coronaries, such as cannot be brought against any other organ or tissue. The following case of Dr. H. P. Marshall's will illustrate this evidence.

J. T. F., age 48, a woodman. In 1924 he had pain in the chest after heavy lifting, which lasted several hours. In 1926 he began to have repeated attacks of pain in the chest. These precordial pains became so severe and so frequent that July 12, 1927, he consulted Dr. Marshall. The least exertion would bring on an attack of angina pectoris so distressing that he thought he was going to die.

I examined him September 6, taking an electrocardiogram, which gave a negative T wave in lead I and a left ventricular predominance (fig. 1). On October 11 he died very suddenly during an attack.

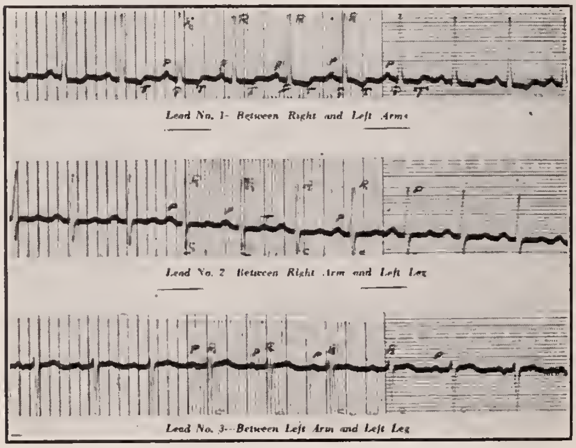
Lead No. 1- Between Right and Left Arms
Lead No. 2 Between Right Arm and Left Leg
Lead No. 3- Between Left Arm and Left Leg

Fig. 1. Electrocardiogram showing inverted T wave in lead I and left ventricular predominance.

An autopsy was performed by Dr. M. M. Patton. "The heart was somewhat enlarged. This enlargement was due principally to hypertrophy of the left ventricle. On opening the heart it was noticed there was extreme fibrosis in the interventricular septum. The aorta showed many arteriosclerotic plaques. No syphilitic plaques present. The aortic valves were calcified. The other valves were apparently normal. The right coronary was sclerotic. The left coronary was extremely sclerotic and occluded. The left ventricle was thickened and showed sclerosis in the upper portion."

Smith,[3] Hamburger[4] and others have produced artificial coronary narrowing and occlusion in animals. The electrocardiogram from these animals, following the coronary artery disturbance, had similar inverted T waves as those in humans who had sclerosed and occluded coronaries. This leads up to the questions under discussion which have caused confusion regarding angina pectoris.

1. *Not every case of coronary artery sclerosis-narrowing causes the symptom-complex of angina pectoris.* The pain of angina pectoris is not due to coronary artery sclerosis nor to either an infarct or sclerosis of the muscles of the heart. The electrocardiogram does not give direct evidence regarding the sclerosed coronary artery or regarding either a thrombus or an embolus.

Willius[5] gives two cases of coronary artery occlusion and infarction. In the first there is no history of previous attacks of angina given. In the second there were light attacks of anginal pain. There is no question but that in both instances the thrombus was caused by sclerosed coronary arteries. After the occlusion occurred as a result of the thrombus, there was ischemia of the muscles of the heart and hence there was pain until collateral circulation had taken care of the muscles outside of the infarct. It could not have been the passive congestion or dilation of the heart that caused the pain to cease.* The pain ended because the ischemic muscles outside of the degenerated muscles of the infarct were cared for by collateral circulation.

There was no pain in the first case previous to the coronary occlusion because there had been no ischemia of the muscles, and there was no change in the electrocardiogram because there was no fibrosis of the muscles. Immediately following the formation of the thrombus there was a normal electrocardiogram in both instances and the change from the normal occurred as the degeneration of the muscles within the area of the infarct took place. Naturally this degeneration would vary in its process, depending upon the character of the collateral blood supply to the muscles affected. Kugel[6] classifies the anastomosing coronaries in three general groups.

March 1, 1927, I examined and took the electrocardiogram of C. E. R., age 46 years. He had been having attacks of angina pectoris, not very severe in character and they passed off in a short time. The electrocardiagrom was normal (fig. 2). July 6, 1927, another electrocardiogram was taken (fig. 3) which sowed an inverted T wave in lead I and a left ventricular predominance. January 30, 1928, another cardiogram showed an improvement in the T wave, lead I (fig. 4). February 22, 1928, he was taken with severe pain at six o'clock in the morning. Dr. John Bird gave him ¾ grain of morphine, with no relief and could get no blood pressure at all. At 9:20 a. m. he died.

In this case, the patient was a strong, healthy, active and comparatively young man. The activities of his busy life easily caused anginal pain, though the electrocardiogram showed no change

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*This explanation does not presume to suppose that there was no ischemia within the area of the infarct. As the area affected by the occluded coronary became smaller, due to the collateral coronary blood supply, changes took place in the ischemic conditions of the muscles, surrounding and within the forming infarct. In the surrounding area the blood supply became more efficient and lessened the ischemic condition, while within the area of the infarct the muscles gradually passed into the condition of degeneration. When the degeneration began, changes in the electrocardiogram began to take place.

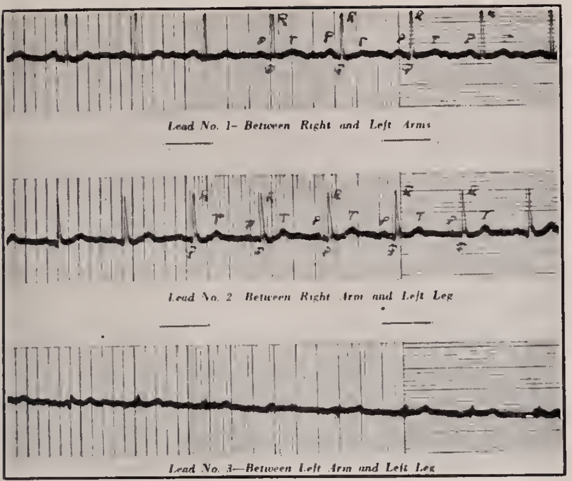
R
T
P
Lead No. 1- Between Right and Left Arms
Lead No. 2 Between Right Arm and Left Leg
Lead No. 3—Between Left Arm and Left Leg

Fig. 2. Normal electrocardiogram.

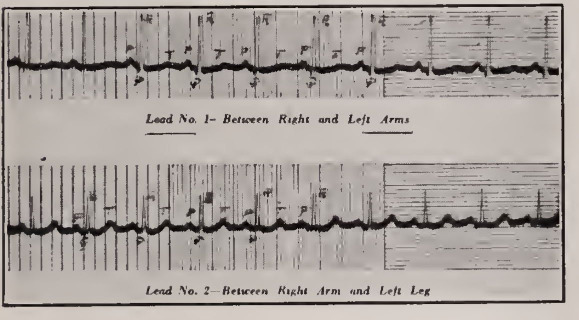
Lead No. 1- Between Right and Left Arms
Lead No. 2—Between Right Arm and Left Leg

Fig. 3. Note the change in this electrocardiogram, compared with that of fig. 2. The T wave is flattened in lead I and the Q R S is also changed.

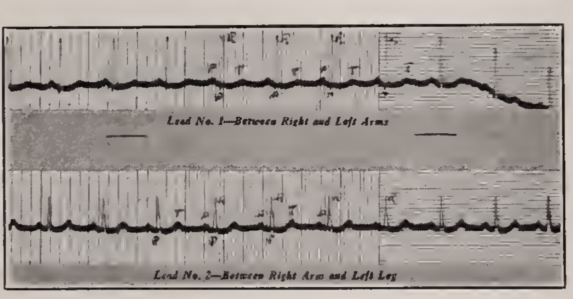
Lead No. 1—Between Right and Left Arms
Lead No. 2—Between Right Arm and Left Leg

Fig. 4. This electrocardiogram was taken about three weeks before the occlusion of the coronary artery which caused the death of the patient and about seven months after the electrocardiogram of fig. 3. Note the slight improvement in the T wave.

from the normal when I first examined him, even though the coronaries were sclerosed. Four months later, when the second electrocardiogram was taken, there was a change in it, undoubtedly indicating a fibrosed myocardium as the result of sclerosed coronary artery. This is in agreement with the teaching of Mackenzie that angina pectoris is caused by ischemia of the muscles of the heart.

It is not difficult to understand, then, how there might be a gradual fibrosis of the coronary artery with a corresponding fibrosis and hypertrophy of the muscles of the heart without there being ischemia and angina. It is unusual for this condition to occur in young people[7]. It occurs in older people, in whom the activities of life have slowed up so that there is no special strain thrown on the heart to cause ischemia. Place these same sclerosed coronary arteries in a young man and what would be the result? The quickened metabolism of youth and the strenuous physical activities would cause not only ischemia and pain but also a rapid breaking down in the muscles of the heart.

2. *Autopsy has shown normal coronary arteries, arteries not narrowed, in persons who during life gave the history of angina pectoris.* Children may run until they are stopped by pain in the side, anginal in character. A person upon hearing unexpected news may have a sensation over the heart either pleasing or distressing according to the character of the news received. In the first instance, Mackenzie has explained that this pain is due to ischemia of a perfectly normal heart muscle, due to excessive muscular exercise. In the second instance, the ischemia and pain can be explained through the action of the sympathetic nervous system, acting upon the coronary arteries causing angiospasm.

Bearing upon this subject Smith[8] says, "The action of the vagi and sympathetic nerves on the coronary arteries has been more extensively investigated, perhaps, than any other physiologic aspect of the coronary circulation. The studies on isolated sections of the coronary arteries have been concerned chiefly with the observations on the effect of epinephrine because of the action this drug is said to have on the sympathetic nerves. By this method epinephrine has repeatedly produced a dilation of strips of coronary arteries from the sheep, goat, ox, calf and rabbit. Barbour, however, who used human coronary arteries removed at autopsy while the body was still warm, observed a constriction." He concludes that, while the evidence regarding the action of the vagi and sympathetic nerves on the coronary artery of the mammal is not conclusive, it is suggestive. Mix[7] gives an instance of a woman being cured of angina pectoris by relieving adhesions in the right colon. He was convinced that angina pectoris was due to angiospasm of the coronary arteries as the result of the adhesions.

Miss L. R., age 47, began menstruating when thirteen. At the age of twenty-five cysts were removed from each ovary because of painful menstruation. For years she was constipated, had digestive disturbances and sought relief at the Mayo clinic at the age of thirty-five. Here an abdominal operation was performed, removing adhesions attaching the colon to the abdominal wall and liver. At the age of forty-three she stopped menstruating.

Three years ago, at the age of forty-four, she awoke one night with severe pain in the chest. For several months following this she felt a weight over the chest the size of a brick. One year ago she was awakened at night with severe pain over the chest. The attending physician found her pulseless. She thought she was dying. Exertion or excitement brings on the pain. The nitrates relieve it only temporarily.

During the last year her physician, Dr. Harry Robinson, says her systolic blood pressure has varied from 110 to 230 mm., the diastolic from 90 to 110 mm. It might be suggested that the same condition which has caused the angina pectoris caused the high blood pressure. The arteries were not hardened on palpation. The electrocardiogram taken October 26, 1927, was normal and February 18, 1928, there was no change in it.

The attacks of angina in this instance were unquestionably due to angiospasm. Examination revealed nothing that would indicate a sclerotic condition of the coronary arteries.

In regard to the influence of the aorta over the coronary arteries, Torry[10] says: "Does an aneurism of the arch interfere with the proper or favorable delivery of the blood to the coronary arteries? It is not only conceivable but seems probable that a profound change in conditions relative to the coronary artery supply takes place, as a result of the relatively rigid aorta of a limited capacity being replaced by a comparatively voluminous and easily distensible sac, whose walls yield to each thrust of the ventricle."

Smith[3] has shown by experiments on dogs that the coronary circulation is modified by the blood pressure, that "while the systolic blood pressure no doubt influences the coronary flow, it is subordinate to that of the diastolic pressure." This would indicate that the heart receives most of its blood supply through the coronary arteries during the diastole, for the reason that the arteries are compressed by the contracting muscles of the heart during the systole, while during the diastole they are free to receive the blood from the aorta and the amount of blood received depends upon the amount of pressure in the aorta during the diastole. Smith further says: "On the basis of these observations it is suggested that the decreased coronary flow associated with diminished diastolic pressure in aortic regurgitation and arteriovenous aneurism is probably a significant factor in the development of cardiac hypertrophy and later cardiac failure."

Anrep, Cruickshank, Downing and Rau[11] have shown that the coronary outflow occurs in three waves. "The first wave of the coronary outflow is directly dependent upon the contraction of the auricles. The second wave is the smallest; its beginning is associated with the onset of the ventricular contraction. The second wave is abruptly changed into the large third wave. The third wave reaches its summit at the end of the ejection phase" of the ventricle. These authors not only demonstrate that the outflow of the coronary arteries occurs during the systole but that the inflow, especially of the left ventricle, is expected to be arrested during the ejection phase.

Though these authors enter more into detail of the coronary circulation, they practically agree with the findings of Smith. If the low diastolic blood pressure occuring in aortic regurgitation and arteriovenous aneurism is a "significant factor in the development of cardiac hypertrophy and later cardiac failure," as suggested by Smith, why should not this same factor enter into the cardiac failure which occurs in thyrotoxic conditions and heart block? Whether the low diastolic blood pressure does ever enter as a factor in producing ischemia of the muscles of the heart and thus pain, remains for investigation.

3. *Coronary artery sclerosis, narrowed or occluded, has caused atypical symptoms of angina pectoris.* Herrmann[12] gives a series of atypical cases of angina pectoris. Some of these cases had symptoms which were indicative of abdominal trouble. In one instance a surgical consulant "considered the patient in too profound a state of collapse to think of surgical procedure." The characteristic changed electrocardiagram directed the attention to the heart as the cause of the trouble.

Pardee[13] says: "I have seen a patient whose first symptoms were apparently typical of acute gastric indigestion. There was severe pain referred to the epigastrium with nausea and vomiting and marked prostration." Hamburger[4] says: "The clinical picture of coronary disease is still so new, and in many quarters unrecognized or unappreciated by the profession at large, particularly those atypical cases of coronary disease, in which the outstanding symptoms are largely abdominal and in which the casual diagnosis is 'acute indigestion,' 'ptomain poisoning,' 'gallbladder disease,' etc."

May 20, 1926, Mr. E. U. W. came to me for examination. He was a carpenter, age 57, and had been a hard worker. About two weeks previously he had been taken ill at night with a severe pain which he said had been diagnosed as gallstones. Following this attack he had no more pain but had dyspnea on exertion. An electrocardiogram, taken March, 1927, showed an inverted T wave in lead I and a left ventricular predominance (fig. 5). An autopsy was not obtained when he died a few months later.

There is no question that there are cases of coronary artery occlusion as the result of either a thrombus or embolus (almost always a thrombus), which are atypical because pain is not a prominent symptom. The following case will illustrate.

About Dec. 30, 1927, Mrs. M. W., age 72, was awakened at night with a sensation of smothering. This attack of dyspnea lasted about one hour, when it ceased, and she went to sleep with no more symptoms during the night. Upon arising the next morning, however, she noticed that exertion of any kind brought on an attack of difficult breathing. This symptom, coming on so suddenly, has persisted to the present time, and unquestionably is due to occlusion of the coronary artery. The fluoroscope shows tne left ventricle decidedly hypertrophied. The electrocardiogram shows a characteristic inversion of the T wave in leads I and II, with a left ventricular predominance (fig. 6).

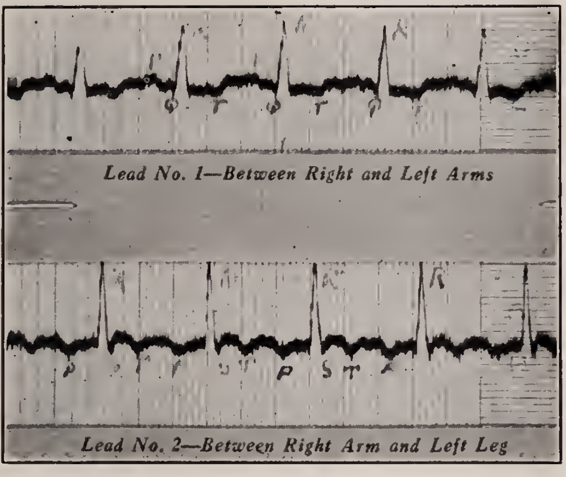
Lead No. 1—Between Right and Left Arms
Lead No. 2—Between Right Arm and Left Leg

Fig. 5. Shows convexed inverted T wave in lead I and a very pronounced left ventricular predominance.

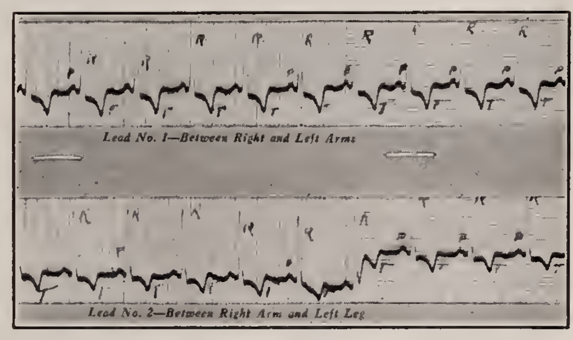
Lead No. 1—Between Right and Left Arms
Lead No. 2—Between Right Arm and Left Leg

Fig. 6. Inversion of the T wave in leads I and II with a left ventricular predominance.

CONCLUSIONS

The real purpose for this discussion is not to enumerate different conditions which might, through their influence over the coronary artery, cause ischemia and anginal pain. There seems to be no question but that angiospasm of the coronaries may take place through the action of the sympathetic nervous system. It is not unreasonable to believe that abnormal conditions of the aorta may interfere with the blood supply to the coronary arteries. It is certain that low diastolic blood pressure lessens the flow of blood to the coronaries.

Notwithstanding these conditions, which may or may not cause ischemia and anginal pain, the real disease of the heart, which is on the increase in taking the lives of men actively engaged in strenuous business, is myocardial degeneration. In this degeneration of the myocardium a fibrosis is found which is generally caused by coronary sclerosis or there may be an infarct as a result of the occlusion of a coronary artery. The occlusion is caused by a thrombus or an embolus, generally a thrombus. There may be, of course, a slow occlusion through a gradual closure of a sclerosed coronary branch.

Myocardial fibrosis is accompanied by a hypertrophy, generally of the left ventricle. There is very little edema if any. There may or may not be anginal pain. There is a change in the electrocardiogram, generally a characteristic inversion of the T wave.

The characteristic symptoms of coronary artery occlusion are sudden unrelieved pain, great prostration, a fall in the blood pressure, some fever, leucocytosis and a precordial friction sound. The electrocardiogram gives the characteristic inverted T wave. There may be other changes in the electrocardiogram.

McCrae[14], in discussing the circulation in relation to surgery, says "We are all aware of the difficulty of deciding as to the absence of myocardial disease, but if a proper study is made the number of cases in which doubt remains should not be very large. But a proper study means careful history, with special attention to possible infection and careful observation of the patient. An electrocardiogram should be made if possible, as it may show evidence of disease otherwise not to be diagnosed."

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ACUTE SUPPURATIVE APPENDICITIS IN INFANT OF THREE MONTHS*

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This case presented several interesting features which would tend to obscure the true diagnosis.

Baby Robert C., age three months, normal birth, third in the family, had been bottle fed on a rational formula and had progressed satisfactorily until the present time. During the afternoon of March 25 he was a little fussy and did not take the six o'clock bottle as well as usual and the same with the ten o'clock feeding.

About midnight the parents were awakened by the fussing and restlessness of the child, which was quite unusual. The diaper was removed and the mother was startled by seeing a quantity of blood and mucus mixed with the stool. While holding the baby there was another discharge of bloody mucus with some stool.

When first seen at about 1:30 a.m. March 26, 1928, the child presented the appearance of one in pain, knees drawn up, face pinched and pale. The temperature was 99.2°, the throat, ears, nose, heart, lungs and reflexes were normal. The abdomen was soft and no mass palpable. Nothing abnormal was felt rectally, but withdrawal of the finger was followed by a considerable discharge of bloody mucus. At this time the infant vomited for the first time; nothing unusual about the vomitus was noted.

While palpating the abdomen a second time the child suddenly became happy and chuckling, and when offered the bottle took it eagerly. The parents were instructed to give a soda enema with the hips elevated and were told that there had probably been an intussusception which had apparently reduced spontaneously, but to call later if there was any repetition of symptoms.

At 6 a.m. the father reported that the baby had vomited again and there had been two more bloody mucous passages. That apparently made a clear case of intussusception, so he was taken to the hospital and a surgeon called to see him.

Dr. O. S. Proctor made a careful examination which was essentially the same as the previous one, except that he wondered if there was not a little resistance in the lower right quadrant.

At 10 o'clock the anesthetic was started. When he became relaxed the abdomen was palpated again and no mass could be felt. As the abdomen was opened, a small amount of serous fluid escaped and the small bowel was seen to be moderately distended. Several clots of blood were seen in the large bowel. A careful search revealed no trace of an intussusception. There was some difficulty in locating the ileocecal junction, and when finally the appendix came into view, one could see that it was clearly pathologic.

It was large, dusky red color and clubbed at the distal end, but was not perforated. Its removal was easily accomplished, the abdomen closed and the infant returned to its room in good condition.

The laboratory report on the appendix was as follows: Measurement, 7 cm. x .7 cm., lumen filled with pus. Diagnosis, acute purulent appendicitis.

The postoperative course was very stormy. The same afternoon the temperature rose to 103°, and for the next five days fluctuated between 102° and 105°. Fluids were taken fairly well; considerable flatus and two or three liquid stools a day were passed. On the third day vomiting started and persisted in spite of all treatment. There were no findings in the chest, but the abdomen became progressively distended.

Blood from the father had been given intramuscularly the day of the operation and from the second postoperative day 500 to 600 c.c. of 2 per cent glucose in normal saline were given by hypodermoclysis. The vomiting continued and the child died on the fifth postoperative day.

Autopsy showed a slight hypostatic congestion of the lungs. The heart was normal. The abdomen was greatly distended, the parietal peritoneum deeply injected, a semipurulent exudate covering its surface. The abdominal wound was healed and the appendiceal stump tightly closed with no abscess formation. The kidney cortex was deeply injected.

Death was due to an acute purulent peritonitis, following appendectomy. A secondary acute parenchymatous nephritis was present. Cultures showed colon and staphylococcus.

COMMENTS

A blood count was not made but probably it would not have differentiated an intussusception from an acute appendicitis. With such a clear cut history it is hard to believe that there had not been an intussusception present, but we found no evidence of it at operation and the pathologist found none later. There may have been an intussusception that was stimulated by the acute appendix, the latter may have become inflamed while included in the intussusception, or there may not have been any intussusception, the bloody discharge coming from the lumen of the appendix and the neighboring mucosa.

Cobb Building.

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*Read before Seattle Pediatric Society, Seattle, Wash., March 20, 1928.

STREPTOCOCCUS MENINGITIS

REPORT OF A CASE IN A FIVE-DAY OLD INFANT*

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Meningitis in the newborn is an uncommon condition. Streptococcus meningitis in the first few days of life is extremely rare. In all, only twenty-one cases of meningitis in the first two weeks of life have been reported. Of these, ten are classed as "newborn" without reference to their exact age. The six cases cited by Holt as occurring in the newborn are the only ones reported, where the streptococcus and staphylococcus are mentioned as a cause of the meningitis. This type of meningitis, he states, is most often associated with spina bifida.

The following case is reported, not only on account of its rarity but because of the typical history of birth injury and clinical symptoms of intracranial hemorrhage which would surely have been given as the cause of death, had not cistern puncture and autopsy showed a streptococcus meningitis.

Baby J. was the second child of young healthy parents. Delivery was accomplished after version and extreme traction through a very narrow pelvis. The baby was resuscitated with difficulty, being very white and limp at first, and then began to "pick up" slowly until at the end of the second day of life she was nursing at her mother's breasts and appeared like a normal baby.

There were no cyanotic spells, twitchings, nystagmus nor convulsions until the end of the fourth day of life, when the baby refused to nurse. The temperature rose to 104° F. and there were repeated cyanotic spells with twitchings of the muscles of the face, arms and legs. Lateral nystagmus was present. Incomplete convulsions appeared at intervals of from one to two hours. Jaundice was marked at this time.

Fourteen hours after the onset of these symptoms a cistern puncture was done. A very yellow, slightly turbid fluid under less than normal pressure was obtained. This fluid contained very few red blood cells and was crowded with short chained streptococci. The infant died two hours later.

An autopsy performed by Dr. W. C. Hunter revealed a small amount of bloody fluid at the base of the brain, with traumatic laceration of tentorium cerebelli. Fibrin was present as evidence of early meningitis. There was no gross brain hemorrhage or brain lesion. Death was due to streptococcus meningitis. Cultures taken from the spinal fluid over the convexity of the cerebrum show a heavy growth of streptococcus within twenty-four hours. No portal of invasion for the infection was discovered.

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The causative organisms and ages of the reported cases are shown in the following table.

AUTHOR	DATE	AGE	ORGANISM	
Hinsdale	1899	three days	B. coli.	
Sherer	1891	eight days	B. coli.	
Sherer	1891	nine days	B. coli.	
Shieb	1900	eight days	B. lactis aerogenes	
Goldreich	1902	one day	B. coli.	Death on second day
Noeggeroth	1907	eleven days	B. coli.	Death on sixteenth day
Benfey	1907	seven days	B. pyocyaneus	Death on eighth day
Holt	1911	newborn (six cases)	Streptococcus and staphylococcus	
Bonhoff and Esch	1912	six days	B. mucosus capsuatus	Death on seventeenth day
Koplik	1916	newborn	Meningococcus	
Koplik	1916	newborn	Pneumococcus	
Koplik	1916	newborn	B. coli.	
Barron	1918	eleven days	B. coli.	
L'Esperance	1920	three days	Pneumococcus	Death on sixth day
Rowe and Kohlbry	1924	five days	B. coli.	
Author's Case	1927	five days	Streptococcus	

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AGRANULOCYTIC ANGINA WITHOUT ULCERATION *

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That agranulocytic angina, now an accepted syndrome characterized by local inflammation in the mouth or pharynx and an unusual blood picture, is not always an ulcerative or membranous condition was brought to my attention recently by observation of a case.

Schultz, a German, in 1922 called our attention to a group of cases with gangrenous stomatitis and leukopenia, occurring in women of middle age. The tonsillar region and the pharynx became ulcerated and in some cases gangrenous. The red blood cells, hemoglobin and platelets were normal. The white blood corpuscles were greatly reduced in number, and the polymorphonuclear leucocytes were decreased or absent. Because of the absence of polymorphonuclear cells or granulocytes in the presence of sore throat, Schultz attached the name of agranulocytic angina to the condition.

Lovett in this country, in 1924, reported a case of ulcerative pharyngitis with leukopenia and called attention to the similarity of his case to those reported in the German literature. Since that report there have been about fourteen cases reported in our own literature. In all but one case report either exudate similar to a diphtheritic membrane or ulceration is mentioned, or rather it is described as the outstanding feature in the throat picture.

CASE REPORT

Housewife, aged 63, first seen April 3, 1928, on account of sore throat. Her illness began April 1 with dysphagia, headache and abdominal distress. The past history was not important. She was examined one month before and only a mild hypertension found.

Examination of the throat disclosed a red and edematous condition of the right side, involving the tonsil and pillars. There was a definite line of demarcation between the healthy and diseased tissues. Thinking that a peritonsillar abscess was developing, hot saline irrigations, aspirin and chloretone powders were ordered. The throat condition made little progress during the next two days, except the beginning of a similar condition on the left side. At this time a maculopapular eruption appeared over the back and arms. The skin otherwise was clear. There was no icterus. There were no palpable glands in the neck. The examination of the heart and lungs revealed nothing abnormal. The abdomen was distended, and she complained of some low abdominal pain. There was no vomiting. The extremities were negative except the eruption mentioned above.

On April 6, the sixth day of her illness, the white blood corpuscles numbered 2600 with 92 per cent mononuclears and eight per cent polymorphonuclears. Culture from the throat showed staphylococci, fusiform bacilli and a bipolar staining organism resembling the diphtheria bacillus that was gram-negative. Hemoglobin 73 per cent; red blood cells 3,540,000; platelets 330,000. The blood culture showed a gram-negative bacillus, resembling Friedlander's bacillus. The Wassermann was negative. The urine showed slight trace of albumin and an occasional hyaline cast.

April 7. The throat condition was worse, the left side now showed the same amount of swelling as the right. However, there was no exudate or ulceration. On this day the white blood cells numbered 1400 with 96 per cent mononuclears and 4 per cent polys.

April 9. Blood examination showed 600 white blood cells. No polys were found. The temperature varied from 101° to 104.5°.

Besides local applications to the throat of hot saline, argyrol and hydrogen peroxide, the treatment included salycilates internally, whole blood intramuscularly and mercurochrome intravenously.

Twelve hours before death a complete examination of the nose and throat revealed no membrane or ulceration anywhere. There was no obstruction, and the larynx was clear.

She died on the tenth day, apparently of circulatory failure.

About 80 per cent of the cases reported have been in females between the ages of thirty and sixty-five.

Five reports mention the finding of a gram-negative bipolar staining organism in the throat culture that was motile, which they identified as bacillus pyocyaneus. The organism in my case corresponds, but unfortunately was not tested for motility.

Hart reports the finding of Friedlander's bacillus in the blood culture, and it is interesting to note that this is the same case that was free from ulceration. The streptococcus and staphylococcus aureus have also been reported in the blood culture, and many have been negative.

The white blood cell counts vary from 2400 to 100, the average being about 800. Mercurochrome, gentian violet and salvarsan have been given intravenously and whole blood and diphtheria antitoxin intramuscularly without help. Kastlin found a fatal outcome in forty of the forty-three cases that he collected.

Many of the cases showed icterus and a number a skin eruption, varying from a mild erythema to a marked maculopapular eruption, suggesting a hemorrhagic basis in some cases.

With the condition in mind, the diagnosis is not difficult after the blood counts have been made. However, it is imperative that we remember there are other conditions in which we encounter an angina accompanied by agranulocytosis. I saw a case of purpura about six months ago, in which the leukopenia reached 600 cells before death and there were no polymorphonuclear cells. The patient had

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* Read before a Meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology, Seattle, Wash., May 1, 1928.

numerous ulcerations about the mouth and throat, due to broken down purpuric spots. In this case the platelets numbered 62,000, and the tourniquet test was positive.

It is evident from the case reports that some of the cases reported as agranulocytic angina are not different from the cases of hemorrhagic purpura, with which we are all familiar. In monocytic angina the total number of white cells is normal with only slight variations above or below. The prognosis is more favorable in this condition.

The prognosis in agranulocytic angina is decidedly unfavorable, and the average course is eight days. The consensus of opinion seems to be that death follows circulatory failure.

CONCLUSIONS

1. The throat lesions in agranulocytic angina are not always ulcerative or membranous.
2. The study of cases with angina and agranulocytosis should include a platelet count and a tourniquiet test to rule out purpura hemorrhagica.
3. Cases of monocytic angina, in which the total white cell count is normal or slightly increased, should not be confused, as the prognosis in these cases is more favorable.

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A SIMPLE TREATMENT OF EXTENSIVE BURNS

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The object of treatment of burns is, first, to save life and next to save epithelium with all the far reaching complications that its loss implies.

The observations made on dehydration or blood concentration as an index to prognosis by Underhill* and others is extremely important. Their statement that a hemoglobin estimate is a reliable measure of this concentration makes it practically available. If the hemoglobin registers below 120 per cent prognosis is good and above 140 per cent it is extremely grave.

The shocked patient needs large amounts of morphine at once to relieve pain, conserve energy and control him sufficiently to apply immediate life saving treatment, as the introduction of liquids, cleaning and covering the wounds and maintaining body heat. One-half grain of morphine is none too much to start with. At the same time prepare a 20 per cent soda bicarbonate solution. Soak the gauze and apply covering outside with oil silk and a deep layer of cotton held in place by bandages. Thus protected the patient may be moved to a hospital when, if unconscious, intravenous or subcutaneous introduction of 10 per cent glucose 2,000 c.c., normal saline 2,000 c.c., every twenty-four hours should be started. Morphine one-eighth grain and digitalin one-hundredth grain every hour should be given, unless the patient is asleep. Transfusion tends to increase the blood concentration and is not advisable. Tetanus antitoxin always should be used.

In the less severe cases hot water by mouth, a glass every fifteen minutes, should be urged from the very start. Also proctoclysis should be used but is not to be depended upon. Forcing liquids for a short period is possibly a relief to one's conscience, but to benefit the patient it should be measured in days, not hours. Fresh soda solution should be applied from time to time for twenty-four hours.

Preparations should then be complete for a rapid change and thorough clean-up, a warm room, light anesthesia and sufficient help, with all dressings convenient. The moist dressings will peel off without trouble. Here I would like to say that classification of burns is of pathologic importance, but should be entirely disregarded from a surgical viewpoint.

Shreddy skin should be cleansed off; cut away any charred tissue; blebs, large or small, should be disregarded as they take care of themselves. The whole surface may now be washed off with ether, and this allowed to evaporate. If the hospital facilities include a warm electric cabinet that the patient may be put in for days, nothing could be better. He should be placed so that the minimum friction on the burned areas will result.

A continuous hot bath is theoretically ideal, but practically none of us can use this method and we must resort to some form of covering. It is trite to say the less the better. We all have noted a burned face, that is very difficult to bandage comfortably and is therefore left open, heal up much more rapidly than the equally burned hands that lend themselves so readily to the dressing art.

To Dr. Orr of Lincoln, Nebraska, we all owe a debt for standing against precedent and refusing to dress and redress wounds with all the consequences entailed. Every severe burn with its daily change of dressings, even in adults, is a trial, and in children one must be blessed with considerable egotism to carry it on. Every removal of dressing means some bleeding, some loss of epithelium, some secondary infection, some loss of morale and fear of the next time. This means loss of sleep, appetite, weight, and a general decline that may lead to transfusions, skin graftings, long hospitalization and permanent deformity.

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* Underhill: Ann. of Surg., Dec., 1927.

Many years ago an English surgeon advocated a 10 per cent stearate of zinc-vaseline ointment for use in burns. This is somewhat antiseptic, very light, may be rubbed readily into the meshes of gauze and so does not adhere to the surface. The dressing is applied over the entire cleansed area, well covered with cotton and not changed for eight days. The fact that the patient's general condition improves, that he eats and sleeps and his temperature falls has been warrant enough to let him alone in the few cases tried, in spite of the odor that seems inevitable.

When the dressing is removed, one is surprised at the amount of seriously burned surface that has entirely been covered by good epithelium. The blisters are gone, the deeper burns are now gangrenous and this tissue may be removed or redressed and allowed to separate. At the next dressing one is surprised to note that many epithelial islands have formed in the center of the large granulating areas. I am beginning to think these islands are often the takes of the grafts that one has used. They certainly appear in the most unexpected places.

One may need to dress oftener after the first or second time, cleaning up with peroxide or mercurochrome and using the ointment liberally. These later dressings are not painful and if grafts are needed no time has been really lost. Ultraviolet treatment or direct sunlight is a great help in cleaning up and covering denuded areas.

This is offered as a simple method that seems to be satisfactory in some of these distressing conditions. The criticism of delay for twenty-four hours in performing an elaborate debridement and sterilization may be well taken, but in view of unfavorable surroundings, with shock, pain and loss of body heat, one is often not warranted in taking time to organize for a thorough clean-up. When treated as outlined the need of skin grafting is extremely rare and, as the use of grafts from another individual is now obsolete, the field has been greatly narrowed. In cases needing it most one hesitates to subject the patient to more trauma.

BACTERIA FROM GOITER TISSUES

BACTERIOLOGIC TECHNIC FOR THEIR CULTIVATION

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As introduction to a singular technic for the cultivation of bacteria from goiter tissues, certain features must be stressed, upon which success depends. These, which are later described in detail, involve principles which in themselves are independent of the question of bacteria, but upon which the latter depend for the successful evolution of bacterial growth. It is likely that this technic has never been used before and its singularity is attested to by those working with it.

While each step in any technic is important, the most essential, as will be later appreciated, is the first. Unless a sufficient amount of tissue is used the results will be negative, since an unusual issue is involved. As the technic is described these features are elucidated. Regardless of type of goiter, practically one hundred per cent positive cultures are obtained. Upon these findings the writer is advancing that which appears as the etiologic factor in the genesis of goiter.

Contrary to the almost universal negativity of bacterial cultures from goiter tissues by the usual technics, the singularity of the following, with confirmations in hand from several laboratories, should forever settle that which appears as the missing link upon the centuries old conundrum of the question of the cause of goiter. The present bankrupt status of a bacterial cause is due entirely to the past inability to cultivate bacteria with any degree of constancy. A rehabilitation of such a factor is practically assured upon the results obtained by the following technic.

A large piece of freshly removed goiter tissue is pushed into a sterile, one by six inch test tube. The tissue should fill at least one inch of the bottom of the tube. More than this is superfluous, although giving still more assurance of positive growths. For meticulous attention against the possibility of contamination, the tissue removed should not be touched by anything, save sterile instruments, avoiding contact with the skin, and placed into the sterile tube as promptly as possible.

After plugging with sterile gauze, the tube is taken to the laboratory, where the end is flamed in a large burner and the gauze removed. Continuing the heat until the fusing temperature of glass is reached, the end, with a pair of heated forceps is drawn into a narrow neck. The heat is so applied that none of it reaches the tissues at the bottom of the tube. After setting aside to cool, the neck is scratched with a glass cutting stone. Heat applied to the line by the flame or a bead of hot glass will cause the neck to break off.

The ratio of tissue to tube volume should now approximate one to three. Into this tissue tube is flowed enough Ringer solution to cover the tissue (see below for preparation of special tubes). After glass sealing in the flame the tube is placed in the incubator. After twenty-four hours the tube is opened under flame control against the possibility of contamination, when five to ten cubic centimeters of neutral to litmus glucose broth is added. Incubation is continued after glass sealing.

At the end of the second twenty-four hour period of incubation, the tube is again opened and with a freshly drawn capillary tube an inoculation or transplantation is made into specially made ampule tubes of neutral broth and also upon ampule tubes of glucose agar. All tubes after each step are promptly glass-sealed and placed in the incubator. In no part except the first step in obtaining the specimens in the surgery is the cotton stopper used. In the writer's hands practically every goiter tissue, so far studied in this manner, has shown a positive culture in the liquid tubes and in a large percentage of the agar slants on primary transplantation. Those which fail to develop on primary transplantation at the end of the first forty-eight hour period show up later, when seeded on subsequent days, from either the primary tissue tube or from the positive broth culture. For reasons cultures may be negative from the tissues of the old cystic types of goiter, particularly if the specimen is composed of cysts and much fibrous tissue and very little parenchyma.

Cultures when obtained in the glass sealed agar slants will keep their appearance for a long time, since there is no evaporation and the contained humidity is constant. Transplants from these are limited to a relatively short time. After thirty days a subculture is slow to develop and after two months not at all.

While it is a general rule that positive cultures show after the primary transplantation from the tissue tubes, those failing to do so will show later on, some requiring as long as ten days. These late cultures should be made from the original tissue tubes. There is never a long delayed appearance of growth on the agar slants. In the broth tubes practically one hundred per cent show up before the end of ninety-six hours. Type of goiter does not absolutely predicate the speed of culture.

Control tubes are made by making a transplantation immediately after adding the Ringer solution and shaking the tube. Singularly these are almost invariably negative. Transplantations with an element of control are generally negative, when made at the end of twenty-four hours of incubation. Positive controls, which occasionally show up, should be watched as irregular types, different from the generally found Gram-positive coccus.

Whether these are symbiotic or contaminations is yet to be determined. Symbiotic types are frequent enough and are likely to show in the long standing goiter. A check on this score calls for a most meticulous aseptic technic in collecting the specimens in the surgery. All culture tubes should be stored in the incubator a sufficient length of time to insure sterility.

The broth and Ringer solution tubes are made up in long necked ampules. Just before use and when about to add their contents to the primary tissue tubes, these are opened under flame control. The long neck is flamed several times, when the content is blown out, after inverting and inserting the neck into the tissue tubes, by touching the flame to the up-ended bottom. The possibility of contamination is reduced to the last degree. The probability of some contaminations is most likely to be found in a not quite ideal aseptic technic in obtaining the specimens in the surgery.

With large goiters the searing of the surface with a hot iron and removing a section through the seared surface may be done, in which event the heat-treated surface tissue should not be included in the tube. Inclusion of cooked tissue defeats the possibility of bacterial culture. Care, therefore, must be exercised in not applying the heat long enough to drive steam deep into the tissue.

The earliest manifestations of positive bacterial growth are seen under the microscope with the ultracondensor, which show as agglutinin forms. These are usually present in the primary tissue tubes at the time of making the primary transplantations or at the end of forty-eight hours. The writer considers these agglutinin forms as due to the presence of alexin bodies, which are extracted from the tissues by the Ringer solution. With the destruction of complement, these agglutinin forms disappear with the advent of transplantable forms, followed by luxuriant growth in transplants.

The organisms specific to goiter are considered obligatory anaerobes while in the goiter tissues and they have facultative properties which are gradually assumed, but not until an anaerobic state in the primary tissue tubes is first established. The importance of the first step in obtaining a sufficiently large piece of tissue is apparent. The anaerobic state is accomplished by the oxidation processes of the parenchyma cells, which are not immediately dead after their removal from the neck and placement in the tubes. The continuing vital processes in the tissues fix all of the free oxygen contained in the glass-sealed tube, when the facultative adaptations of the organisms begin and eventual aerobic properties are assumed.

Several studies with the commonly found coccus seem to indicate that a reversion to the anaerobic state predominates. Transplantations in consecutive series from originally luxuriant cultures fail to show the same or maintained avidity to growth. These features are open to investigation. Opening up a positively new issue upon the subject of goiter obviously introduces many features that are beyond the compass of unsubsidized individual effort. The limit of time for subcultures from agar slants is approximately two months. The autolytic sterilization of broth cultures does not run parallel with the behavior of agar cultures. The writer's interpretation is of the neutral phenomena involved, upon which the possibility of bacterial culture from goiter tissue depends.

The organisms present in the living goiter are obligatory anaerobic cocci. The differentiation between a series of these cultures is a large task. There are many features for consideration which are beyond the scope of the initial fact of bacteriologic findings in practically all goiters. The obligatory anaerobic nature of these organisms has probably been assumed, a fact at least conjectured with many known bacteria. under the proposition that all oxygen in the body is combined and none absolutely free.

Before any change can take place which allows these bacteria to develop in an environment that is radically different from its recent one, in which alexin bodies are present, its total status quo as present in the unremoved goiter must be transferred to a tube and simulated in the important matter of perfect anaerobiosis. The vital processes in these tissues, sealed in glass, continue for an undetermined period of time, but sufficient to cause a fixation of all of the free oxygen contained in the tube. The Ringer solution is the least shocking to the tissue cells. The extraction of alexin bodies and their dilution produces a gradual transition in the environment.

The manifold vital processes of blood circulation having been severed, the organisms in asserting demands for existence are forced to adapt themselves to a gradually changing environment. The natural defensive forces of the tissues, including the present antibodies, are exhausted; the interval addition of oxygen contained in the added broth allows the facultative properties of the bacteria to assert themselves and the possibility of transplantation on artificial culture media is soon evident in positive cultures. This tentative explanation is offered upon the development of these cultures. Whether merit can or cannot be attached to this interpretation is of

CHART 1

Name	Date 1927	APRIL, 1928								
		18	19	20	21	24	25	26	27	28
W B Mc	1/28	—	—	—	—	—	—	—	—	—
W W P	1/28	x	—	—	—	—	—	—	—	—
R C S	2/7	x	—	—	—	—	—	—	—	—
C D H	2/9	—	—	—	—	—	—	—	—	—
M T N	2/10	—	—	—	—	—	—	—	—	—
W N K	2/21	—	—	—	—	—	—	—	—	—
J B Mc	2/21	—	—	—	—	—	—	—	—	—
H J W	3/21	—	—	—	—	—	—	—	—	—
Pheif	3/22	—	—	—	—	—	—	—	—	—
W D R	3/28	—	—	—	—	—	—	—	—	—
H J W	4/2	—	—	—	—	—	—	—	—	—
W W M	4/11	—	—	—	—	—	—	—	—	—
H J W	4/23	—	—	—	—	—	—	—	—	—
H J W	4/24	—	—	—	—	—	—	—	—	—
H G W	4/29	—	—	—	—	—	—	—	—	—
W D R	4/29	—	—	—	—	—	—	—	—	—
R C C	5/10	—	—	—	—	—	—	—	—	—
R C C 1	5/13	—	—	—	—	—	—	—	—	—
R C C 2	5/13	—	—	—	—	—	—	—	—	—
R C C 3	5/13	—	—	—	—	—	—	—	—	—
W W M	5/14	—	—	—	—	—	—	—	—	—
W W M	5/23	—	—	—	—	—	—	—	—	—
C D H 1	6/3	—	—	—	—	—	—	—	—	—
C D H 2	6/3	—	—	—	—	—	—	—	—	—
C D H 3	6/3	—	—	—	—	—	—	—	—	—
R C S	6/14	—	—	—	—	—	—	—	—	—
G W C 1	7/18	—	—	—	—	—	—	—	—	—
G W C 2	7/18	—	—	—	—	—	—	—	—	—
G W C 3	7/18	—	—	—	—	—	—	—	—	—
G W C 6	7/18	—	—	—	—	—	—	—	—	—
G W C 8	7/18	—	—	—	—	—	—	—	—	—
G W C 9	7/18	—	—	—	—	—	—	—	—	—
G W C 10	7/18	—	—	—	—	—	—	—	—	—
G W C 11	7/18	—	—	—	—	—	—	—	—	—
G W C 12	7/18	—	—	—	—	—	—	—	—	—
G W C 13	7/18	—	—	—	—	—	—	—	—	—
G W C 14	7/18	—	—	—	—	—	—	—	—	—
G W C 15	7/18	—	—	—	—	—	—	—	—	—
G W C 16	7/18	—	—	—	—	—	—	—	—	—
G W C 17	7/18	—	—	—	—	—	—	—	—	—
J B Mc	8/5	—	—	—	—	—	—	—	—	—
W W P	8/26	—	—	—	—	—	—	—	—	—
W D R	10/7	—	—	—	—	—	—	—	—	—
C O W 3	10/17	—	—	—	—	—	—	—	—	—
C O W 6	10/17	—	—	—	—	—	—	—	—	—
W W P	10/17	—	—	—	—	—	—	—	—	—
W B Mc	10/20	—	—	—	—	—	—	—	—	—
S R Mc	10/25	—	—	—	—	—	—	—	—	—
W D R	11/1	—	—	—	—	—	—	—	—	—
W W M	11/1	—	—	—	—	—	—	—	—	—
J W M 1	12/6	—	—	—	—	—	—	—	—	—
J W M 2	12/6	—	—	—	—	—	—	—	—	—
J W M 3	12/6	—	—	—	—	—	—	—	—	—
	1928									
P O R	1/3	—	—	—	—	—	—	—	—	—
S R Mc	1/28	—	—	—	—	—	—	—	—	—
H J W r	1/30	—	x							
H J W 1	1/30	—	x							
W D R	2/18	—	—	—	x					
M T N 1	2/18	—	—	—	—	x				
M T N r	2/18	—	—	—	—	x				
M T N 1	2/29	—	—	—	—	—	—	x		
M T N r	2/29	—	—	—	—	—	—	x		
R C S	3/24	—	x							
C C T 1	3/31	—	x							
C C T r	3/31	—	x							
J T M ar	4/7	—	x							
J T M 1r	4/7	—	x							
J T M b	4/7	—	x							
TOTAL 68.										

little importance, compared with the fact that by this technic practically one hundred per cent positive cultures are obtained from goiter tissues, regardless of type of goiter.

PREPARATION OF SPECIAL TUBES

The preparation of these tubes is a simple matter. Test-tubes are fused in a strong Bunsen burner and drawn into long necked ampules. With the Ringer solution, the broth medium and hot agar previously made, the bodies of these tubes are heated and then up-ended in the media. The partial vacuum created by the heat draws up the medium as the tubes cool. The amount drawn into each tube is readily controlled. Since better than one-half vacuum is created in the tubes by the flame, the agar slants are the only ones requiring attention as to the amount admitted for a properly made slant. The long ends of these tubes are glass-sealed, and after fractional sterilization they are stored in the incubator for several days. The agar slants when old should be rehydrated by boiling to insure a moist and unglazed surface.

CHART 2

Name	Date 1927	APRIL, 1928					
		3	4	5	7	10	20
R C S	1/14	—	—	—	—	—	—
W W P	1/28	—	x				
W B Mc	1/28	—	—	—	—	—	—
GG R K	1/30	—	—	—	—	—	—
R C S	2/ 7	—	—	—	x		
W N K	2/21	—	—	x			
J B Mc	2/21	—	—	—	x		
W W M	2/21	—	—	—	—	—	—
J T M	3/14	—	—	—	—	—	—
Pfeif.	3/16	—	x				
H J W	3/21	—	x				
Pfeif	3/22	—	—	x			
H J W	4/ 2	—	—	—	—	—	—
H J W	4/23	—	—	x			
R C C	4/26	—	—	—	—	—	—
W D R	4/29	—	—	—	—	—	—
H J W	5/ 2	—	x				
R C C	5/10	—	x				
R C C	5/18	—	—	—	—	—	—
R C C 1	5/13	—	—	—	—	—	—
R C C 2	5/13	—	—	—	—	—	—
R C C 3	5/13	—	—	x			
S R Mc.	5/24	—	—	—	—	—	—
R C C	6/ 1	—	—	—	x		
C D H 1	6/ 3	—	—	—	—	x	
C D H 2	6/ 3	—	—	x			
C D H	6/ 8	—	—	—	—	—	—
G W C 1	7/18	—	—	—	—	x	
G W C 2	7/18	—	x				
G W C 3	7/18	—	x				
G W C 6	7/18	—	—	—	x		
G W C 8	7/18	—	—	—	—	—	—
G W C 9	7/18	—	—	—	—	—	—
G W C 10	7/18	—	—	—	—	—	—
G W C 11	7/18	—	—	x			
G W C 12	7/18	—	x				
G W C 13	7/18	—	—	—	—	—	—
G W C 14	7/18	—	—	x			
G W C 15	7/18	—	—	x			
G W C 16	7/18	—	—	x			
G W C 17	7/18	—	—	x			
TOTAL 41.							
Positives		8	10	4	2		
Negatives		17					

The accompanying chart 1 is a record of transplantation made upon fresh agar from the original agar-positive cultures, the ages of which are indicated by the dates when specimens were first obtained. These transplantations were made on April 17, 1928.

The striking feature of this chart is the negativity of transplants in all of the tubes whose age is over two months, the only positives appearing from the most recent cultures. It must be emphasized that the original agar cultures, glass-sealed, have been subjected to but a slight degree of desiccation, the water of condensation being present in sufficient quantity to maintain a constant humidity.

Chart 2 is a record of transplantations made from original fifty cubic centimeter broth cultures, the age of each indicated. Transplantations were made on April 2, 1928. Contrary to the rule of bacterial autolysis in broth cultures, there is quite a disparity in results, when compared with chart 1.

In answer to a common criticism, the question always present of possible contamination, the following control was put on in several cases. The results in these delicate controls establishes the possibility of removing tissues without contamination and confirming the infection basis of goiter as advanced. Sterile cotton applicators or gauze are rubbed into the tissues of the neck during the various stages of thyroidectomy and each placed into a sterile test tube. Culture medium is added but without thyroid tissue. During the essential steps of obtaining these specimens extreme care is taken to avoid contact with the skin by blocking it away with sterile towels and avoiding contact with the gloved fingers. The ends of sterile instruments alone touch. No culture shows up in any of the tubes, except the tissue containing tube.

SCURVY WITH REFERENCE ESPECIALLY TO ADULTS. The cardinal diagnostic points in the seventeen adult ords were, according to George C. Shattuck, Boston cases of scurvy from the Boston City Hospital rec- (*Journal A.M.A.*, June 9, 1928): 1. Extensive painful ecchymoses involving the legs. 2. Swelling of gums in patients having teeth. 3. Absence of the blood changes characteristic of purpura hemorrhagica (namely, marked decrease of blood platelets, prolonged bleeding time, and failure of the blood clot to retract). 4. A history pointing to dietary deficiency. It is necessary to exclude hemophilia; the acute infectious diseases, including arthritis, of which purpuric spots may be symptomatic; the toxic purpuras, including those due to drugs, to benzene poisoning or to liver disease, and, probably, certain hysterical states and mechanical vascular defects. Other forms of "cachetic purpura" have been described as being related to cancer, tuberculosis, Hodgkin's disease, nephritis and old age. In such cases the possibility of a scorbutic basis should always be borne in mind, and the therapeutic test might well be applied before excluding scurvy. It is clear that well marked scurvy in the adult may easily pass unrecognized and that failure to make the diagnosis is generally due to failure to consider the possibility of scurvy.

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EDITORIAL

THE BUSINESS OF MEDICAL PRACTICE

Our readers may spend a few minutes profitably in studying Pusey's recent article under the general head of "Medicine Economics."* He thinks "it might be fitting to consider some of the problems of our profession as a bread and butter occupation," and he frankly calls this "the *business* of the practice of medicine." How many men we all know who will be horrified or at least pretend so to be by this bold designation! Rarely do we hear one physician ask another, "how is business." Most of us prefer to escape in fancy from the fact that we are all in the business of medical practice and so we ask one another, "how is practice these days." Clearly this is a product of the English viewpoint that those who are in business are in some way engaged in an inferior occupation, and we try to escape the thought by a designation that is more euphemistic.

Pusey well says, "It is medicine's glory that altruism is ingrained into its traditions." Yet he feels that we must not entirely neglect the business of the profession by which we live. He points out the numerous aggressions which are being made upon us as private physicians, and shows how a certain self-appointed commission "is proposing to study the whole subject of medical practice." He thinks "the commission is of the opinion that medical practice as it is now conducted should be wiped out and replaced by state medicine and industrial and other forms of corporate practice."

The aggressions of teaching hospitals, medical schools and dispensaries, beginning with the practice of medicine for the indigent, have increased until at the present time many such organizations have stepped over into practice for pay on patients who are not charity cases and at what are substantially cut rates. Various lay institutions have also attempted to organize and conduct practice and many such organizations are employing physicians whom they pay and from whom a profit is made. Pusey recommends and believes that the problem is worthy of profound study and that we should not be content with investigation alone but should ourselves demand a constructive policy and participate in it.

To the writer the danger of socialism in medicine and of state control of medicine is increasing. Something must be done to check the progress of these tendencies. State medicine can no more succeed than did national control of railroads and the more forms of medical practice that are put under state care, the worse it will be, not only for the physician but for the state and its citizens. In theory, to many state control seems ideal. But one has but to contact such phases as are under state control to realize its stultifying effects on scientific progress and individualism. Dr. Pusey deserves the congratulations and commendations of a united profession for his frankness and courage in attacking a serious problem which threatens the rights of its members.

THE NATIONAL TUBERCULOSIS CONVENTION

From June 19 to 21 the National Tuberculosis Association held its annual convention in Portland. This association is a voluntary organization of physicians, laymen and associations, formed in 1904 for the purpose of developing ways and means to study, control, treat and prevent tuberculosis. As the result of developing these purposes every state has an organization to fight tuberculosis and there are over fifteen hundred local societies throughout the country. They have had an active part in the care of cases and the prevention of the disease, which have reduced by half the deaths from tuberculosis during the past quarter century.

During the meeting considerable interest was expressed in papers by representatives from Yale and Cornell universities and Rockefeller Institute, three of the thirty-one institutions cooperating in the research program of the National Association. This phase of the work is of especial interest to the Northwest through the McDermott Foundation for Research, established a few years ago at the University of Washington, of which Professor John Weinzirl, head of the bacteriology department, is director. At the suggestion of the National research committee he has undertaken a study of the biology of the tubercle bacillus and in addition is conducting a series of experiments in attempting to desensitize tuberculous animals with a considerable degree of success.

This meeting was the largest the National Association has held on the Pacific coast, having a total registration of 748. A large delegation was present from Oregon and Washington, the Washington Tuberculosis Association having held its annual meeting in Vancouver immediately preceding the national convention, which was attended by the majority of the state delegates. Atlantic City, where the National Tuberculosis Association was organized in 1904, was selected for the twenty-fifth meeting to be held the week of May 27, 1929.

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* Pusey, W. A.: Some Tendencies in the Business of the Practice of Medicine, J. A. M. A., p. 1897, June 9, 1928.

THE MINNEAPOLIS AMERICAN MEDICAL ASSOCIATION MEETING

To report a meeting, where between seven and eight thousand doctors congregate for four days, is almost like a soldier trying to give his impression of a battle. There are so many meetings, so many new things to see, so many entertainments that any report must leave out many things of importance that should be mentioned. The fact that the House of Delegates had a spirited contest between Atlantic City and Portland, Ore. and decided by a large majority to meet in Portland next year should be an inspiration to every practitioner of medicine in the Northwest. If one has not hitherto attended one of these meetings, he should plan to attend the Portland session in 1929 because the annual meeting of the American Medical Association, with its sectional papers, scientific and technical exhibits and numerous other things of interest to the medical profession, is today one of the greatest medical meetings in all the world. In the words of Dr. William D. Haggard, ex-president of the Association, "You of the Northwest are fortunate because the meeting of the American Medical Association leaves a lasting impression in every community where it convenes. It is an education to the physicians of that vicinity, an inspiration for them to do better work, and it is a great education to the laymen of these sections."

The first few days of the meeting permit the members of the House of Delegates to attend to the business of the association, allowing other visitors to inspect the technical and scientific exhibits These seem to get larger as the years go on until one wonders how large and extensive they will eventually become. The atmosphere of the technical exhibit is somewhat different from that of the section meetings. They bring together the manufacturers' representatives who present an orderly, well arranged, instructive showing of dependable products with trained attendants to explain their uses and advantages. The greatest number of displays this year seemed to be of the physiotherapy and roentgen-ray apparatus. Trained experts were present at each booth to answer questions and explain problems of technic. The latest models of apparatus for diagnosis, anesthesia and other uses were represented. Problems pertaining to the special food diet of infants and invalids were considered, with experienced men ready to explain the advantages of their preparations. Publishers' exhibits showed thousands of medical books, displayed in an attractive manner. In fact, one could have spent the whole time at these exhibts and profited by each minute.

The scientific exhibit presented names of exhibitors and descriptions of exhibits, arranged according to classification and then alphabetically according to the name of the exhibitor. One of the outstanding exhibits was that on fractures. It comprised an exhibit of practical interest to practitioners on the following fractures: Fracture of the clavicle, supracondylar fracture of the humerus, fractures of the leg, fractures of the ankle joint, plaster-of-paris bandages: (a) how to make them, (b) how to store them, (c) how to use them. The committee secured the services of seventy-five physicians who gave continuous demonstration throughout the entire meeting, daily from 9 to 1 and from 2 to 5. These consisted of well recognized methods of handling practically every fracture that may occur in any bone of the body. The medical department of the United States Army contributed their part of this demonstration. In each booth the demonstrations consisted of a living model, with the necessary appliances for treating the fractures specified. The Section on Radiology cooperated with the fracture exhibit by means of film displays, covering the fractures to be discussed in the year's exhibits. Any physician who was at all interested in fractures could well have spent his entire time with the fracture exhibit and been benefited by it.

There were so many things of interest in the Scientific Exhibit that one would hesitate to mention any one in preference to another. However, it could be noted that many paused for a considerable time at the booth on morbid anatomy. This was under the direction of Dr. Elexius C. Bell, Professor of Pathology and head of the department of Pathology, University of Minnesota Medical School. Fresh pathologic material was shown daily from the hospitals of Minneapolis and St. Paul, supplemented by material from the schools of veterinary medicine at Minneapolis. These gross specimens were demonstrated, one after another, as rapidly as one group of men would move on to allow another group to listen in.

One of the outstanding events was presentation of the gold medal to Dr. Walter M. Simpson, of Miami Valley Hospital, Dayton, Ohio, for his exhibit on "Tularemia." This consisted of gross specimens and photomicrographs of the most rapidly fatal case (four days) of tularemia on record, also photographs selected from approximately fifty proved nonfatal cases occurring in and about Dayton. Of interest to physicians in the Northwest was the fact that Miss Jessie Phillips, medical artist of Seattle, drew all of the pictures exhibited by Dr. Simpson, which in its way helped to secure the gold medal. One cannot close the description of the scientific exhibit without commending the studies and statistics presented by the American Society for the Control of Cancer, also the American Hospital Association and the National Committee for Hygiene.

In addition to technical and scientific exhibits there were diagnostic clinics and clinical lectures by some of the leading members of the profession. Two which created the most interest were lectures on "Injection Treatment of Varicose Veins," by Dexter Hathaway Witte of Milwaukee, and "Diagnosis of Disease of the Gallbladder," by Evartz A. Graham of St. Louis. Others of interest were one on goiter by Frank H. Lahey, diabetes by Elliott P. Joslin, pernicious anemia by J. H. Musser, pediatrics by McKim Marriott, tularemia by F. E. Frances and septic ulcer by R. C. Coffey. There are sixteen different sections, representing every phase of medicine and surgery. In each from eighteen to twenty-four papers are read. There were approximately three hundred and sixty papers read by men from practically every state and section of the Union. There were two essayists from the Northwest, one from Portland and one from Seattle.

WESTERN BRANCH OF AMERICAN PUBLIC HEALTH ASSOCIATION

Last month a conference was held in Portland, attended by a group of physicians and public health workers, which resulted in the establishment of the Western Branch of the American Public Health Association. Since the parent organization, with headquarters on the Atlantic coast, functions chiefly east of the Rocky Mountains, it was believed that the interest of public health matters would be promoted by the organization of a western branch, covering health activities among the states west of the mountains. There are many features of public health work of vital interest to general practitioners, public health nurses, sanitary engineers, tuberculosis workers and other specialists which will be benefited by such an organization among these far-western states. It is suggested that the organization shall meet semiannually, so that interested workers can get together for the discussion and better understanding of local and general problems. Among other subjects discussed at this conference, special stress was laid on the importance of more careful examination of Mexicans to eliminate communicable disease carriers and further investigation into prevalence of trachoma and tuberculosis among the Indians. Within a few months this public health organization will be organized and prepared to function in a manner that will undoubtedly be greatly advantageous for the promotion of public health in this western section.

LOW MORTALITY RATES

Statistics from the U. S. Bureau of the Census present some interesting figures of birth and death rates for the registration area during 1927. They cover reports from thirty-three states. The death rates in twenty-eight of these were lower than for 1926. The highest death rate per one thousand population is 13.9, shown for Vermont, while the lowest, 7.1, is found in Idaho. The infant mortality rates were lower than for the year 1926 in thirty states. The highest rate is 125.8, for Arizona, while the lowest, 47.5, is shown for Oregon. The report gives the infant mortality rate for forty-eight cities of 100,000 population or more according to the last census. Of these, forty-two had a lower death rate than during the previous year. The lowest, 41.4, appears for Seattle, the highest, 87.1, being shown for Norfolk, Va. It is interesting to note that birth rates were lower than for 1926 in twenty-three of the listed states. The highest birth rate, 23.8 per one thousand population, appears for North Carolina, while the lowest, 13.6, is shown for Montana. According to these figures, it appears that the Pacific Northwest still continues to present favorable features for longevity, being similar in this respect to previous census reports. The residents of this section of our land should congratulate themselves on this hopeful future prospect.

IDAHO ANNUAL MEETING

Idaho State Medical Association will hold its annual meeting in connection with the tri-state meeting of the associations of Idaho, Montana and Wyoming in the Yellowstone National Park, August 27-29. The program schedules Idaho for the first day, Montana for the second, Wyoming for the third. Papers will be presented during the morning period, each afternoon being devoted to sight-seeing trips in the park. At 7 o'clock each evening the respective associations of delegates will hold their individual meetings. At 9 o'clock social entertainment will be provided by the wives of the attending physicians, the program being assigned to Idaho ladies on the twenty-seventh, Montana on the twenty-eighth, Wyoming on the twenty-ninth.

Headquarters for the meeting will be at the Canyon Hotel. Visitors will be entertained either at the hotel or at the hotel camp. It is essential that reservations be secured in good season by writing either to the Yellowstone Park Hotel Company or to the manager of the Yellowstone Parks Camp Company, the address of both being Yellowstone, Wyoming.

PROGRAM

Monday, August 27

Idaho Day

8 a.m. Call to Order

President's Address, Alexander Barclay, Coeur d' Alene, Ida.

"Emergency Surgery," Dean Lewis, Surgeon-in-Chief, Johns Hopkins Hospital, Baltimore, Md.

"Some Lessons from Physiology in the Surgery of the Stomach," Jabez N. Jackson, President, American Medical Association, Kansas City, Mo.

"The Treatment of Pelvic Infections," Henry Schmitz, Loyola University, Chicago, Ill.

"The Treatment of Nonmalignant Lesions of the Stomach and Duodenum," Donald C. Balfour, Mayo Clinic, Rochester, Minn.

"The Work of the American Medical Association," (with lantern slides), Morris Fishbein, Editor, Journal of the American Medical Association, Chicago, Ill.

"Fractures," Paul B. Magnuson, Chicago, Ill.

Tuesday, August 28

Montana Day

8 a.m. Call to Order

President's Address, George M. Jennings, Missoula, Mont.

"Splenomegalie in Childhood," Julian Hess, Chicago, Ill.

"Clinical Interpretation of Blood Pressure Values," (lantern slides), P. M. Krall, Kansas City, Mo.

"The Differential Diagnosis and Treatment of Lesions of the Tongue," (lantern slides), E. P. Zeisler, Chicago, Ill.

"Modern Advances in Ophthalmic Therapeutics," Harry S. Gradle, Chicago, Ill.

"Head Injuries, Differential Diagnosis and Treatment," C. W. Hopkins, Chief Surgeon, Chicago and Northwestern Railway Co., Chicago, Ill.

"The Curability of Cancer," George A. Soper, Pd.D., Managing Director for the Control of Cancer, New York City.

Wednesday, August 29

Wyoming Day

8 a.m. Call to Order

President's Address, A. P. Kimball, Casper, Wyo. (now located at Logan, Utah).

"The Importance of the Simpler Methods of Physical Diagnosis," W. S. Thayer, President-Elect, American Medical Association, Baltimore, Md.

"The Relation of Abdominal Ptosis to Abdominal Gastrointestinal Function and Pain. Treatment." R. C. Coffey, Portland, Ore.

"The Surgery of Thyrotoxicosis," (lantern slides), J. R. Buchbinder, Chicago, Ill.

"A Postoperative Review of One Thousand Operations for Goiter," C. A. Roeder, Omaha, Neb.

"The Care of Juvenile Diabetes," C. F. Kemper, Editor Colorado Medicine, Denver, Colo.

"Treatment of Pregnancy in Patients with Diabetes," Russell Wilder, Mayo Clinic, Rochester, Minn.

"The Presence and Management of Prostatic Hypertrophy," F. M. McCollum, Kansas City, Mo.

WASHINGTON ASSOCIATION MEETING AT SEATTLE

The annual meeting of the Washington State Medical Association will be held at Seattle, August 27-30. The sessions will be scheduled at the Junior Ball Room of the Olympic Hotel. The first day, Aug. 27, will be devoted to the golf tournament, details of which will be published later.

Three days will be devoted to the program, the first of which, the 28th, will include papers by members of the state association. The program for the 29th and 30th will comprise papers by distinguished members of the profession from other sections. There will be a paper on surgery by Dr. Dean Lewis of Johns Hopkins; on urology by Dr. Arthur H. Crosbie, Boston, Mass. Dr. Louis A. Buie of the Mayo Foundation will speak on rectal diseases, while Dr. Frank Lynch of University of California will present some phase of gynecology. Professor Trevor Kincaid of University of Washington will discuss heredity.

The social features will consist of a banquet on the evening of Aug. 29 and a dinner dance Aug. 30. More details of the program and other items of information will appear in our next issue.

MEDICAL NOTES

OREGON

The National Tuberculosis Association held its twenty-fourth annual convention in Portland June 19-21 with 600 members in attendance. Due to the illness of the president of the association, Dr. Henry L. Taylor, Vice-President Alfred Henry of Indianapolis presided at the general sessions which were held at the Masonic Temple. One of the features of the convention was the awarding of the Trudeau medal for research in the field of tuberculosis to Sir Robert W. Philips, president of the British Medical Society. His plan for the control of tuberculosis in Edinburgh, Scotland, has attained world-wide recognition.

The paper of the president of the association, Dr. Henry L. Taylor, was read in his absence. In it he made a plea for more efficient control of discharged sanatorium patients, in order to decrease as much as possible the number of relapses. Dr. Brian O'Brien, Perrysburg, N. Y., presented the results of his experiments on the relation of skin pigmentation to the beneficial effects of ultraviolet light therapy. Dr. W. W. Coblentz, of the United States bureau of standards, called attention to the tendency of ultraviolet light passing through permeable commercial glass to diminish in power of transmitting their rays with continued use.

A number of affiliated organizations met in conjunction with the convention. These included the Pacific Coast branch of the American Public Health Association, the National Conference of Tuberculosis Secretaries, the Oregon County and City Health Officers Association, the Nurses Association of Oregon and the American Sanatorium Association.

American Medical Association to Meet in Portland. At the recent convention of the American Medical Association in Minneapolis, Minn., Portland was selected from a group of several petitioning cities as the seat of the association's 1929 convention. This is the first time that the national body has met in the Pacific Northwest since 1905. It is expected that this meeting, which will be held next spring or early summer, will attract more than seven thousand medical visitors and their families to this region.

University to Aid Clinic. The board of regents of the University of Oregon, at a meeting in Eugene June 10, passed a resolution agreeing to contribute $50,000 annually to the proposed new out-patient clinic at Portland. The clinic, which will be used for clinical instruction in the University of Oregon medical school, has already been assured of a yearly budget of $40,000 from the Portland Community Chest. The regents of the University propose next to make a request to the General Education Board of New York for an appropriation of $100,000 for the purpose of constructing and equipping the clinic.

Health Officers Meet. Health officers of the Pacific Coast States were in attendance at a meeting in Portland June 11-12. The primary purpose of the meeting was the organization of a western branch of the American Public Health Association. The city and county health officers of Oregon held a separate meeting June 12. The topics discussed included "Standardizing the Qualifications of Part Time Health Officers," and "Stream Pollution and Sewage Disposal."

Eastern Physicians Visit Portland. A meeting of the Interstate Post-Graduate Medical Association of North America, composed principally of leading physicians in eastern cities, was held at the University of Oregon medical school, Portland, June 3. Approximately forty-five doctors were in attendance. Clinics were held in the morning at several Portland hospitals. In the afternoon a program was presented by members of the medical school faculty under the direction of Dr. Harold B. Myers.

Pacific Christian Hospital of Eugene, owned by The International Bible Mission which operates Eugene Bible University and several other institutions in Oregon and other states, is now running the old Mercy Hospital in connection with Pacific Christian Hospital. The old Mercy Hospital is being used for medical cases, while surgery and obstetrics are cared for at Pacific Christian Hospital. This gives the hospital a total of over 150 beds. There are now over thirty physicians on the staff. A large Nurses' Training School is being maintained. At the annual meeting of the staff, held June 4, Dr. Charles E. Hunt was elected chief of staff and Drs. F. M. Day, O. R. Gullion and I. R. Fox were elected members of the advisory board.

Addition to Hospital Is Planned. Property was recently acquired by the Klamath General Hospital for the purpose of erecting a new addition to the present institution. When completed this will increase the total bed capacity to 110.

Dr. Lewa Wilkes, who has been engaged in study for the past winter at the Postgraduate Eye and Ear Infirmary in New York, has returned to La Grande, where he has resumed his association with Dr. Lee B. Bouvy.

Seaside Hospital Opened. The old Seaside hospital at Seaside has recently been refurnished and opened to the medical profession. The institution contains a fully equipped surgery. Approximately forty patients can be accommodated.

Doctor's Exchange Organized. An emergency telephone exchange has been organized at the Columbia Hospital, Astoria, for the convenience of local physicians and their patients.

WASHINGTON

Bequest to Children's Home. The trustees of the late Julius Galland have announced the gift of $10,000 to the Spokane Children's Home. The bequest is to be used to erect a twenty-bed isolation hospital for the use of children at the home.

Sedro-Woolley Hospital Assured. Plans have been completed for the financing of a new city hospital at Sedro-Woolley. The proposed structure, which will accommodate thirty patients, is to be three stories in height and of modern construction throughout.

Hospital Is Enlarged. An addition is under construction to Virginia Mason Hospital of Seattle. It is a five story structure, 130x42 feet, of concrete and brick. It is being built at a cost of about $255,000. It will contain 90 beds, making a total capacity of 150 beds. All modern equipment is being installed and this will present the last word in hospital construction. The new addition will be open for reception of patients about September 15.

Heads Hospital Staff. Dr. Raymond A. Quigley has been electel president of the staff of the Providence Hospital, Everett.

Seattle Academy of Surgery had its annual banquet at Sorrento Hotel, June 9, to honor jointly the retiring president, Dr. J. C. Moore, and the newly elected president, Dr. A. J. Ghiglione. A large attendance of members was present. Among the speakers were Drs. J. C. Moore, A. J. Ghiglione, C. C. Tiffin, first president of the academy, E. W. Young, L. W. Whitlow, F. R. Underwood and others. The Seattle Academy of Surgery has a limited membership, which is given to certain members of King County Medical Society who have succeeded in the art of surgery.

Railway Surgeons Meet. At the annual meeting of the Great Northern Railway Surgeons Association, which was held in Minneapolis early in June, Dr. Howard J. Knott of Seattle was chosen as president for the coming year. He has served as division surgeon at Seattle for the past five years.

Pediatricians Entertained. Tacoma pediatricians were hosts of the Seattle Pediatric Society on June 15, at the home of Dr. M. S. Miles at Lake Steilacoom. A lawn supper was served to the guests, following which the remainder of the evening was passed in informal discussion around a log fire.

Walla Walla County Medical Society at a meeting on June 7, entertained Dr. E. O. Houda of Tacoma, who discussed his views of the causation of goiter.

Interns Begin Service. Three new interns are to begin service at St. Luke's Hospital, Spokane, on July 1. They are Drs. Lynn E. Lande of the University of Iowa, E. M. Copps of Rush Medical College, and Russell Rees of the University of Indiana Medical School.

Resigns From Tuberculosis Association. Dr. J. J. Markey, who has been connected with the Washington Tuberculosis Association for several years in the capacity of medical examiner, has resigned in order to engage in private practice in Seattle.

Dr. H. S. Jessup, formerly physician at the Valley Hospital, Sequim, and Dr. R. S. Hamilton, who has been engaged in practice at Port Angeles, have moved to Port Townsend, where they have formed a partnership in association with Dr. J. V. De Leon of Bay View.

Appointed to Boxing Commission. Mayor Frank Edwards of Seattle recently announced the appointment of Dr. Jas. T. Moriarty as a member of the Seattle Boxing Commission to succeed Dr. J. S. Thomas.

Club Honors Physician. Dr. John E. Nelson of Seattle, was recently elected president of the Urodians.

Dr. John R. Barber of Stevenson has moved to White Salmon where he will practice in association with Dr. F. B. Zener.

Dr. C. C. Leslie, formerly of Index, has located for practice at Monroe.

Dr. J. Glen Harbison of Spokane has resumed practice after several months travel and study in Europe.

Medical Wedding. Dr. Harry C. Olmsted and Miss Virginia Boutelle, both of Seattle, were married at Pilgrim Congregational Church in that city on June 23.

IDAHO

Canyon County Medical Society held an election of officers at a meeting in Nampa on May 28, with the following result: President, Dr. N. C. Belknap, Nampa; secretary, Dr. T. C. Horton, Nampa; delegates to the Tristate Convention at Yellowstone Park, Dr. Geo. B. Proctor, Nampa, Dr. F. M. Cole, Caldwell; alternates, Dr. V. C. Belknap, Dr. G. W. Montgomery of Caldwell.

Elected to Head Club. Dr. Chas. R. Scott was recently elected president of the Rotary Club of Twin Falls.

Dr. O. M. Husted, formerly of Elk River, has moved to Orofino, where he will assist Dr. R. T. Hopkins in the operation of the Orofino Hospital.

Pocatello Medical Society entertained members of the medical profession from nearby counties at a meeting in Pocatello June 7. Dr. Noble Wiley Jones of Portland conducted a medical clinic on cardiac disease. A dinner at Memorial hall concluded the meeting.

South Side Medical Society met in Twin Falls June 7. Dr. Harmon Tremaine, Boise pediatrician, read a paper which dealt with various phases of prevention and treatment of diseases of childhood. Dr. W. F. Passer, of Twin Falls, opened the discussion of Dr. Tremaine's paper.

Dr. H. D. Junkin of Idaho Falls sailed July 4 from New York for a two months' tour of Europe.

OBITUARIES

Dr. James Thomas Wood of McMinnville, Ore., died at the home of his daughter near Oregon City on June 4, following a long illness, aged 62 years. He was born in Livingston Parish, Louisiana, in 1866, and graduated from the Memphis School of Medicine, Memphis, Tenn., in 1885. He had practiced in McMinnville since 1893, when he was connected with the Barendrick Clinic.

Dr. William H. Holden, Coeur d'Alene, Ida., died at his home on May 31, following a protracted period of invalidism, aged 60 years. He was born in Clarksburg, West Virginia, in 1868, and graduated from Eclectic Medical College, Cincinnati, Ohio, in 1900. After practicing for several years in West Virginia, he moved to Coeur d'Alene in 1907, where he practiced continuously until 1926, when he was forced by ill health to retire.

Dr. Tobias M. English, Pasco, Wash., died at a local hospital June 16, aged 34 years. He was born in Ireland in 1894, and graduated from the medical department of Creighton University, Omaha, Nebraska, in 1922. After an internship at St. Elizabeth hospital at Yakima, he remained in practice in that city for two years. Later he practiced in Seattle, moving to Pasco in 1926.

Dr. Edward L. Latham, Lakeside, Wash., for many years physician at the Colville Indian Reservation, died at his home on May 20, aged 85 years. He was born in 1843 in Columbus, Ohio.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., E. L. Zimmerman; Secty., C. E. Hunt

A meeting of Central Willamette Medical Society was held at Lebanon June 7, as is customary annually at time of the strawberry festival.

The program was presented as follows:

"Some Interesting Diagnostic Problems in the Field of Internal Medicine," Dr. Harold C. Bean, Portland. Discussion opened by Dr. A. H. Ross, Eugene.

"Some Considerations Concerning Pregnancy Complicated by Pyelitis, Tuberculosis or Thyroid Dysfunction," Dr. G. C. Schauffler, Portland. Discussion opened by Dr. Charles E. Hunt, Eugene.

Wives of the members were invited and a banquet served at the Hotel Lebanon. No meetings of the society will be held during July and August. There is a possibility of a special meeting in June to hear Dr. Langley Porter of the University of California Medical School.

EASTERN OREGON DISTRICT MEDICAL SOCIETY

President, A. H. Johnston; Secretary, J. B. Gregory

Eastern Oregon District Medical Society will hold its annual meeting at La Grande July 28, at the Sacajawea Inn. The following program has been prepared:

PROGRAM

Morning Session

6:30 A. M. to 12:30 P. M.

"Studies in Septicemia Over a Period of Ten Years," with report in detail of 92 cases—Dr. Harold C. Bean, Portland.

"Mastoiditis in Infancy and Early Childhood"—Dr. Irving M. Lupton, Portland.

"Exairesis of the Phrenic Nerve in the Treatment of Pulmonary Tuberculosis"—Dr. Ray Matson, Portland.

"Some Considerations Concerning Pregnancy Complicated by Tuberculosis, Pyelitis or Thyroid Dysfunction"—Dr. G. C. Schauffler, Portland.

"The Diagnosis and Treatment of Some of the Common Skeletal Affections of the Back"—Dr. William T. Phy, Hot Lake.

Afternoon Session

1:30 P. M. to 5:30 P. M.

"The Acute Abdomen"—Dr. Robert C. Coffey, Portland.

"Pre-operative Treatment of Exophthalmic Goiter"—Dr. J. Tate Mason, Seattle.

"The Principles Underlying the Treatment of Disabilities Following Infantile Paralysis"—Dr. Richard Dillehunt, Portland.

"Some Specific Applications of Physical Therapy in Clinical Medicine"—Dr. Louis K. Poyntz, Portland.

"The Prevention of Malpractice Suits"—Mr. Clyde C. Foley, Executive Secretary of the Eastern Oregon State Medical Society, Portland.

Business Meeting and Election of Officers

POLK-YAMHILL-MARION COUNTIES SOCIETY

Pres., W. W. Allen; Secty., W. W. Baum

Polk-Yamhill-Marion Counties Medical Society held its last meeting of the season at Salem June 5. Dr. William Le Kleine, director of the Marion County Child Health Demonstration, outlined the future of that organization.

Dr. E. P. Steinmetz of Portland read a paper on the subject "Toxemias of Pregnancy." Dr. J. O. Van Winkle, of Jefferson, spoke on "Medical Army Service."

WASHINGTON

KLICKITAT-SKAMANIA COUNTIES SOCIETY

Pres., J. R. Barber; Secty., F. B. Zener

On Saturday afternoon, May 26, the public meeting, sponsored jointly by the Woman's Association of Goldendale and the Klickitat-Skamania Counties Medical Society, was held in the Presbyterian Church in Goldendale, President John R. Barber presiding. The speaker was Dr. Theodore Adams of the University of Oregon Medical School, who discussed the prenatal, natal and postnatal care to which a woman is entitled, and also the obligation which a woman owes to her attending physician. His talk was in substance, see your doctor early, follow his instructions, have a thorough examination, and keep in touch with him throughout the entire time, wear the right kind of clothes and shoes, eat the right kind of diet.

At six-thirty the Medical Society met for dinner at the home of Dr. and Mrs. F. H. Collins. The guests of honor were Dr. and Mrs. Theodore Adams of Portland, and the wives of the members, Drs. Barber, Bonebrake, Collins, Hartley, Trowbridge and Zener, also Drs. Chick and Dumble of Hood River. After dinner, at the Goldendale Library Dr. Adams discussed "Low Back Ache, its Cause and Treatment."

Minutes of previous meeting were approved as read, following which the following officers were elected for the ensuing year: Dr. F. H. Collins, of Goldendale, president; Dr. Allen Bonebrake, of Goldendale, vice-president; Dr. F. B. Zener, of White Salmon, secretary-treasurer. On the Board of Censors, Dr. John R. Barber was elected to a three-year term; Dr. W. C. Trowbridge to fill the unexpired term of Dr. C. R. Zener, whose membership has been transferred to Clarke County Medical Society.

PIERCE COUNTY MEDICAL SOCIETY

Pres., W. G. Cameron; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in two sessions at Tacoma, May 22. Dr. Harry Spiro, formerly assistant clinical professor of medicine at Stanford University, read the papers which he was later to give at the American Medical Association meeting at Minneapolis.

At the first session, held at the Hotel Winthrop at 4 p. m., his subject was, "X-ray Examination of the Heart as Viewed from Various Angles." This was followed by a dinner at the hotel, and the society met again at 8:15 at its regular rooms in the Washington Building, where Dr. Spiro read a paper on "A Safe Indication for the Use of Quinidin."

TRI-COUNTY MEDICAL SOCIETY

Tri-County Medical Society, which embraces Snohomish, Whatcom and Skagit counties, held its eighth annual meeting at the Whatcom County Golf Club at Bellingham June 19. The scientific sessions were preceded by a golf match.

Among the papers presented was one by Dr. W. C. Cox, Everett, on "The History of Medicine in Snohomish County."

Dr. S. H. Johnson, Bellingham, discussed "The Classification, Etiology and Prevention of Goiter." A banquet was held at the conclusion of the program.

WHITMAN COUNTY MEDICAL SOCIETY

Pres., J. D. Leuty; Secty., J. E. Preucel

Whitman County Medical Society held its regular quarterly meeting in Colfax, June 19, 1928, at Dr. Mitchell's office, President J. D. Lenty presiding.

The paper of the evening on "Acidosis" was read by Dr. J. Edward Preucel, the discussion being opened by Drs. Dolson W. Palmer of Oakdale and Paul G. Weisman, of Colfax. Other members continued the discussion and brought out many instructive and valuable points.

Under the business schedule, besides other matters disposed of, it was agreed to continue the "public health educational activities" as during the two past years. The radio health talks are to be continued from station KWSC, Pullman, the next series to begin October 5. A detailed notice of the radio program will be given to the public some time in September. Most of the talks will be under the direction of the committee on public health, cooperating with the Gorgas Memorial Institute.

The committee on public health and radio health education, appointed by the president, is composed of Drs. R. J. Skafe, J. Edward Preucel, Paul G. Weisman, Dolson W. Palmer and Edgar N. Layton.

Dr. W. A. Mitchell was elected a delegate and Dr. Paul G. Weisman the alternate delegate to the State Association meeting to be held in August.

IDAHO

POCATELLO MEDICAL SOCIETY

Pres., W. W. Brothers; Secty., O. F. Call

Pocatello Medical Society held a meeting at Pocatello, June 7. It was host to a conjoined meeting with southeastern medical societies. Dr. Noble Wiley Jones of Portland was the guest and principal speaker of the meeting.

A Medical Clinic was held at 4 p. m. Dr. Jones discussed "The Clinical Approach to the Cardiac Patient."

After dinner, which was served at 7 p. m., the following papers were presented:

"Consolidation of the Medical Profession in Idaho," by Alexander Barclay, Coeur d'Alene, president of the Idaho Medical Association.

"The Relation of the Motor Disturbances of the Gastro-Intestinal Tract to Chronic Cholecystitis," by Dr. Noble Wiley Jones.

A cinematographic film, sponsored by the American College of Surgeons, was presented on "Surgery of the Hand," by Dr. Allen B. Kanavel.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Physical Diagnosis. By W. D. Rose, M.D., Associate Professor of Clinical Medicine in the University of Arkansas, Little Rock. Fifth Edition, 310 Illustrations and 3 Color Plates. Cloth, 819 pp. $10.00. The C. V. Mosby Co., St. Louis. 1927.

In the new edition of this well known textbook special revision has been made in reference to "pathologic physiology of the heart." The author very clearly points out three distinct forms of aortic regurgitation; the first following ordinary vegetative endocarditis, the second due to syphilis and the third caused by arteriosclerosis of the aorta. In the latter condition it seems to the reviewer that aortic regurgitation is quite rare but that a systolic murmur due to loss of elasticity, or roughening of the intima of the aorta is rather the rule. Aortic regurgitation, formerly taught to be of arteriosclerotic origin, is generally conceded to be of luetic or more rarely streptococcic etiology in most instances. Thus in large cities it has been estimated that fully 75 per cent of cases are due to syphilis and in hospitals the percentage runs nearer 90. The site of greatest intensity of the diastolic aortic murmur is stated by Rose to be in the aortic area, whereas it is recognized by all leading clinicians that this murmur is usually heard in maximum degree to the left of the sternum at the level of the second to fourth cartilages and in only about one-fifth of the cases is it heard more loudly at the conventional aortic area. In the later stages of luetic aortic disease with regurgitation the listener commonly hears a double murmur both at apex and base, i.e., four murmurs with but one valvular lesion. This circumstance the reviewer has found a common source of confusion among examiners who are likely to attribute these sounds to a double valvular lesion which never occurs in syphilis.

Noah Webster defines a murmur as a confused sound but the confusion often exists in the head of the physician and not in the heart of the patient, as has been pointed out by Cabot. It is true that Rose describes the various murmurs that may be heard at different stages of aortic regurgitation but he does not make it sufficiently plain that aortic regurgitation is chiefly of syphilitic origin and that the four murmurs are quite characteristic of advanced stages. In regard to aortic stenosis he affirms that the systolic murmur has its maximum intensity at the aortic area and is transmitted thence in the root of the neck, accompanied by a feeble second sound. We have had the good fortune to observe four patients with so-called "pure" aortic stenosis and to examine them postmortem. In these cases the systolic murmur was transmitted all over the chest and heard most loudly in the third, fourth and fifth interspaces on the right, and not in the neck except in one where the systolic murmur was heard only to the left of the sternum in the second intercostal space. The second aortic sound must be wholly absent in advanced cases because the aortic valves and orifices are wholly transformed into a calcareous ring or slit of unbelievably small lumen, so that closure of the vanished valve is impossible.

The author describes mitral regurgitation as a distinct pathologic entity but mitral regurgitation due to valvular lesions is exceedingly rare in the absence of mitral stenosis, unless due to relative insufficiency from various causes. This is a very practical matter because mitral systolic murmurs may usually be ignored in the absence of definite cardiac enlargement and enormous suffering has been inflicted upon many persons, especially during the war, by magnifying the importance of systolic murmurs at the apex.

Roughening of the valves or an old vegetation may produce a systolic mitral murmur with no loss of heart function. On the other hand, when there is unquestionable cardiac disability from a mitral lesion, there must be mitral stenosis, as mitral regurgitation without stenosis does not produce definite disability. So that mitral disease is a much better term. We feel constrained as a matter of truth to say that there are other books on physical diagnosis superior in quality and costing much less.

WINSLOW.

THE PRINCIPLES AND PRACTICE OF OBSTETRICS. By Joseph B. DeLee, A.M., M.D. Professor of Obstetrics, Northwestern University Medical School. Fifth edition, thoroughly revised. Large octavo of 1140 pages, with 1128 illustrations, 201 in colors. Philadelphia and London. W. B. Saunders Company, 1928. Cloth $12.00 net.

This edition shows a most exhaustively thorough revision. The author has taken all possible means and care to draw on the vast experience gained from the immense amount of material in his work as obstetrician and consultant. The American medical student and practitioner can rightfully be proud of a text-book on so important a subject that easily outranks any other in this country or Europe. Obstetrics, more than any other branch in the daily practice of the profession, requires quick decisive action, when no time can be taken to review the literature on the subject of the case at hand. For this reason it is so essential to have a text-book that can meet the requirements of the practitioner to teach him the subject in a thorough and concise manner. It is also important to have good illustrations that will show almost at a glance the various steps of an obstetric operation. The illustrations in this book are so skilfully drawn that one can almost follow the method of teaching without reading the text. The book is conservative throughout, with a safe margin for new theories and innovations. It is so easy for the average physician to believe anything new, especially when it comes from a so-called authority. A steadying hand by a level-headed guide is an absolute necessity for the obstetrician. If one will follow the teachings of the author he cannot go far wrong.

LANE.

FOLKLORE OF THE TEETH. By Leo Kanner, M.D., Yankton State Hospital, Yankton, S. D. 316 pp. The Macmillan Company, New York, 1928.

Symbolism is the driving force in folklore, related to customs, beliefs, proverbs and usages of all people who have inhabited our planet. All organs of the body have been included in folklore of the past, none of which exceed in quantity that of the teeth. Their whiteness has rendered them the universally outstanding organ among races of all shades of colors. The fate of the milk teeth has been similar among all races of the earth. The tooth is commonly consigned to a mouse, rat or squirrel, in the belief that thereby a vigorous successor will be secured. The necessity of healthy teeth has been recognized since the days of antiquity. "A diamond is not as precious as a tooth," we read in Don Quixote. The author mentions drugs and preparations, such as mastic, betel and gambir, used by various peoples to preserve the teeth white and clean. In all Roman Catholic countries, Saint Apollonia is known as a patroness of toothache. It seems that she endured great suffering in the barbarous extraction of her teeth and prayers expressed to her have been helpful in relieving the agony of the painful tooth. The author describes the sharpening and pointing of teeth among savage tribes, by which they can more effectively lacerate their enemies, and by reason of which also their beauty is enhanced. It is observed that some natives of the Malay Archipelago and of Central America adorn their teeth with inlays of gold, diamonds or pearls. Teeth as drugs and charms have always been considered effective by the inhabitants of some parts of the globe. Many other strange and weird tooth stories are related in this volume.

HAY-FEVER AND ASTHMA. Their Cause, Prevention and Treatment. By Ray M. Balyeat, M.A., M.D., F.A.C.P. Instruction in Medicine and Lecturer on Allergic Disuris in the University of Oklahoma Medical School, etc. Illustrated with 76 Engravings Including 2 in Colors. 310 pp. $3.50. F. A. Davis Co., Philadelphia, 1928.

Reading this book one is impressed with the new type of literature which is rapidly growing in volume that has a dual purpose, one being to familiarize the patient in a simple manner with details necessary to insure his intelligent cooperation, and the other to educate physicians with respect to the details of treatment. This type of publication has a distinct place at the present day, and one sees a

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splendid example of it in this book. Recent progress in this field is incorporated, and the treatment well outlined. The extensive distribution of offending proteins in all sections of the United States is well covered and it will serve as a stable guide for the physician and his patient in whatever section of the country he may be located. The practicing physician who wishes a good guide, containing the best information available in simple terms, will do well to familiarize himself with this volume.

HOFRICHTER.

OPERATIVE SURGERY. By J. Shelton Horsley, M. D., F. A. C. S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. With 756 Original Illustrations. Third Edition. 893 pp. $15.00. The C. V. Mosby Company, St. Louis. 1928.

Much new material has been added to this edition. It stresses the recognition and interpretation of biological processes attending and following surgical operations. A new chapter treats of cicatricial contractions, a knowledge of which may help the operator to avoid this unfortunate result after surgical procedures. A chapter on ligation of arteries with the experimental work of John S. Horsley, Jr., is presented with many illustrations, giving the details of technic. The experimental work of Mann, Williamson and Morton on peptic ulcers will be of use in the suggestions of technic of surgical procedures. A useful chapter presents principles underlying operations for malignant tumors, and the recent work of Gye, Barnard and Bell is summarized with a description of Bell's colloidal lead treatment. Numerous new operations are described, including those of Cutler and Beck on the heart and of Sauerbruch and Braur for thoracoplasty. The volume is so profusely illustrated that the technic of various procedures is clearly outlined and the text markedly supplemented. This is an instructive and handy volume for the operative surgeon.

A MANUAL OF THE PRACTICE OF MEDICINE. By A. A. Stevens, M. D., Professor of Applied Therapeutics in the University of Pennsylvania. Twelfth edition, Revised. 12 mo. of 657 pp., illustrated. Cloth, $3.50 net. W. B. Saunders Company, Philadelphia and London. 1928.

The field for this manual is indicated by its appearance in this twelfth edition, which has been carefully revised and increased by new material. This includes articles on epidemic streptococcus sore throat, chronic ulcerative colitis, Epstein's nephrosis, essential hypertension, sickle-cell anemia, ratbite fever and tularemia. This volume presents a concise description of medical disorders met in common practice. It is a handy volume for ready reference, and furnishes valuable information in few words.

ALUMINUM COMPOUNDS IN FOOD, Including a Digest of the Report of the Referee Board of Scientific Experts on the Influence of Aluminum Compounds on the Nutrition and Health of Man. By Ernest Ellsworth Smith, Ph.D., M. D., Fellow and former President New York Academy of Sciences, etc. 378 pp. $7.00. Paul B. Hoeber, Inc., New York, 1928.

This volume considers the much discussed question of the use of alum in baking powders. Concerning aluminum compounds in food, it is stated that metal receptacles are not injurious for cooking, as has been held by some people. The author conducted researches over a period of years on the question of healthfulness of food prepared with alum baking powder, a report of which is included. President Roosevelt, in 1908, appointed a research board of distinguished scientists to consider this problem. Its report is presented. The final conclusion is that aluminum is a normal ingredient of food and is an essential constituent in living matter. In the body it deports itself much as does iron. It is concluded that alum baking powders in the preparation of food are in no wise less wholesome than other varieties.

THE EXAMINATION OF PATIENTS. By Nellis B. Foster, M. D., Associate Physician to the New York Hospital; Associate Professor of Medicine at Cornell University College of Medicine. Second Edition, Revised. Octavo of 392 pp., Illustrated. Cloth, $4.50 net. Philadelphia and London: W. B. Saunders Company, 1928.

This book is intended to help practitioners of medicine in determining the facts on which rests accurate diagnosis, without which successful treatment of disease is impossible. The chapter on general physical examination lists the essentials which every diagnostician must exercise. Febrile diseases are considered with the diagnostic features which differentiate each of them. Under system examinations diseases are grouped together, as of the respiratory system, cardiovascular system, etc. Considerable space is devoted to neurologic examinations, including those diagnostic points which must be recognized by the keen observer. A study of this volume will benefit every diagnostician.

THE MEDICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume 11, Number 6 (Mayo Clinic Number, May, 1928). Octavo of 330 pages with 89 illustrations and complete Index to Volume 11. Per Clinic Year, July 1927 to May 1928. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This number contains reports presented by thirty-eight members of the staff of Mayo Clinic. They cover a wide range of medical diseases. There are four papers dealing with pathology of the stomach and duodenum, many aspects of which are discussed. Alvarez calls attention to information obtainable in obscure conditions by a study of family history, citing reports of hypertension and appendicitis in members of one family. Presenting some sidelights of hypertension, Rowntree discusses various phases of essential hypertension, emphasizing frequently obscure etiology and calling attention to disorders of the sympathetic system as a possible factor. He thinks the surgeons might pay attention to this feature for operative consideration. Horton gives histories of four cases of hypertension and polycythemia. The relationship betweeen these two conditions should be kept in mind. Randall describes the treatment of a case of occiputposterior presentation delivered by manual correction and forceps delivery. He describes his views for the correct handling of this situation. Many other important diseased conditions are considered.

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ORIGINAL CONTRIBUTIONS

SIMPLE GOITER AND ITS PREVENTION*

David Marine, M.D.
NEW YORK CITY

As our knowledge of the two fundamental sciences of physiology and pathology broadens we are more and more forced to the conclusion that some means of combating disease other than by cure must be developed, if we are to cope successfully with many of the more serious causes of ill health, incapacity and suffering. Whatever our attitude towards preventive medicine may be, the facts are that medical science is always seeking the cause of disease with the hope in view that with this knowledge a means of control may be devised.

Goiter is one of the most important and widespread causes of human suffering and of physical and mental degeneracy, with which society has had throughout all the ages and still has to deal. The curative treatment of goiter with iodine has been actively practised for some 2500 years without any notable decrease in its incidence. Nor has the introduction of surgical treatment during the last fifty years materially affected the general problem of control. It is now quite generally accepted that, unless goiter can be controlled by prevention, no adequate control will be possible.

On the basis of our present knowledge of thyroid physiology and pathology we may divide the diseases of the thyroid due to disturbed function into two broad groups:

I. Thyroid insufficiencies.
    1. Simple goiter (endemic, sporadic).
    2. Myxedema.
        a. Infantile (cretinism).
        b. Adult (Gull's disease).
II. Graves' disease.

Reduced to more popular terms these two groups would be designated hypo- and hyperthyroidism. They overlap to some extent. Myxedema may supervene in exophthalmic goiter and exophthalmic goiter may develop on the basis of simple goiter, although there does not appear to be any necessary relationship between the two groups. This is indicated by the fact that the lower animals are as susceptible to simple goiter as is man, while exophthalmic goiter does not occur spontaneously in them. Simple goiter is primarily a deficiency disease, depending immediately upon a lack of iodine. Exophthalmic goiter, on the other hand, is primarily dependent upon a neuroconstitutional anomaly and the thyroid hyperactivity is of secondary and compensatory nature. The constitutional anomaly underlying Graves' disease may be congenital or acquired, and is closely related to the constitutional defect present in status lymphaticus, Addison's disease and chlorosis.

We are here concerned only with the thyroid insufficiencies which in their milder forms are manifested by simple goiter, while the severest degrees produce cretinism, or as expressed by Morel, goiter is one stage on the road to cretinism. Simple goiter includes those thyroid enlargements in man and animals formerly grouped under endemic, epidemic, sporadic and physiologic. It may occur in any land and in any fresh water animal with the ductless thyroid. Animals living in the sea, so far as is known, are free from the disease. It occurs in all races, in all climates and at all habitable altitudes. In the temperate zones there is a seasonal variation, both in man and animals which is closely related to the seasonal variation in the iodine store of the thyroid.

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* Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

While goiter may occur anywhere, even in mid-ocean, one of the most striking characteristics is the increased incidence in certain more or less defined regions of the world, the so-called districts of endemic goiter. The most notable of these districts are the Himalaya mountain region of Southern Asia, the Alps, the Andean plateau of South America, and in North America the most important areas are the St. Lawrence river and Great Lakes basins, extending west through Minnesota, the Dakotas and the adjacent Canadian provinces, and lastly the Pacific Northwest, including Oregon, Washington and British Columbia. Less important foci occur throughout the Appalachian mountain region, the Rocky Mountain states and the states in the Great Central basin. It will be noted that most of these regions are mountainous, although there are numerous exceptions.

Of greater importance is the occurrence of endemic goiter for the most part on soils deposited from the last glacial period. It is only within the last two or three years that we have acquired uniform data on the incidence of goiter in several parts of the United States. This has been possible largely through the work of Olesen of the United States Public Health Service. The data of several states are given in the accompanying table.

There is also general evidence of variations in the incidence of goiter in these districts during the last one hundred years. There are many reports of the sudden occurence of goiter in large numbers of men and animals, so-called epidemics. In man these epidemics have for the most part occurred in military garrisons, in institutions and in schools. In animals they have been observed in dairy herds, on poultry farms and in fish hatcheries. Some of these outbreaks were in goiter regions while others were not, showing that with the optimum conditions for its development present, goiter may occur anywhere.

GOITER SURVEYS IN THE UNITED STATES

STATE	Totals	BOYS		GIRLS	
		No. Exam.	Percent Goiter	No. Exam.	Percent Goiter
Massachusetts (Olesen & Taylor)	17,197	7,140	8.7	10,057	22.0
Connecticut (Olesen & Taylor)	12,405	5,797	7.0	6,608	29.0
Ohio Cincinnati (Olesen)	47,493	23,710	26.6	23,783	39.8
Ohio Akron (Marine & Kimball)				3,872	56.4
Michigan Grand Rapids	26,213	12,631	32.0	13,584	67.0
Minnesota (Olesen & Clark)	4,061	1,770	41.0	2,291	71.0
Colorado (Olesen)	2,709	1,495	26.5	1,214	37.9
Montana (Foard)	9,311	4,631	13.4	4,690	32.0
Oregon (Olesen)	17,608	8,181	22.2	9,427	38.3

Beginning about the age of puberty, females are more often affected than males. In districts of severest endemic goiter this difference in incidence due to sex is marked. In the lower animals a difference due to sex has not been demonstrated. The periods in life when simple goiter most frequently develops are (1) during fetal life, (2) during pregnancy and lactation, (3) during puberty and (4) during the menopause.

ETIOLOGY

The ultimate cause or causes of simple goiter are still unknown. The immediate cause is a deficiency of the iodine store of the thyroid, and goiter, therefore, is only a symptom of a disturbance in nutrition, in which iodine for one reason or another it not utilized. This deficiency may be relative or absolute and it may result from (1) any factors which increase the need of the organism for the iodine-containing hormone as occurs during puberty, pregnancy and the menopause, during certain infectious diseases, following sufficient injury to the interrenal gland or as a result of abnormal diets, especially excess of fat and protein; (2) any factors which interfere with the utilization of an otherwise adequate intake of iodine somewhat comparable to iron in chlorosis; we have no definite knowledge as yet of such factors, although it is conceivable that intestinal bacteria or the lack of some vitamin-like factor or some heavy metal could prevent its utilization; (3) factors which bring about an abnormally low intake or actual deprivation of iodine either naturally or experimentally.

It has been shown first by Chatin in 1852 and later by many others that in districts of endemic goiter both the food and water derived from such soils are low in iodine. The conception that goiter is due directly to a *contagium vivum* in the sense that this term is ordinarily used may now be abandoned, although it is well known that toxins of bacterial and possibly of other origin may indirectly cause the thyroid to enlarge. Practically every known substance in the soil, air and water has at one time or another been advanced as etiologic factors. Water has been associated with the cause of goiter by all peoples from the remotest times. North American Indians and the inhabitants of Central Africa were strongly convinced that water was a causal factor, as were the Greeks and Romans. If water is a factor, and I think it is, it would appear that it is the lack of some substance, possibly iodine, rather than the presence of some goiterogenic agent that causes the thyroid to hypertrophy. At present the best conception of the etiology of simple goiter is that it is a compensatory or work hypertrophy, arising in the course of nutritional disturbances, possibly of a vitamin nature and immediately depending upon a relative or absolute deficiency of iodine. This leaves the essential or ultimate cause still to be determined.

PATHOLOGIC ANATOMY

The thyroid undergoes a quite definite anatomic and chemical cycle during the development and regressive stages of goiter. The first change in the thyroid in developing goiter is a marked decrease in the iodine store. When this falls below 0.1 per cent of iodine per gram of dried thyroid increased vascularity, cell hypertrophy and hyperplasia occur. The stainable colloid and the iodine store decrease as the hyperplasia increases. The active hyperplasia may either continue on to exhaustion atrophy, characterized by disappearance of the gland cells and generalized sclerosis or *involution* (recovery) may set in and the gland return to its colloid state. This is the nearest to normal both anatomically and chemically a gland can again become which has once undergone active hyperplasia.

The thyroid may undergo active hyperplasia and involution many times during the life cycle of the individual. In man these recurring cycles tend to produce a patchy hyperplasia which frequently continues to the formation of nodules, the so-called nodular or adenomatous goiter. While in rare instances these nodules may arise from fetal rests, there is no doubt that the great majority arise during the late stages of hyperplasia because of different rates of growth. These nodules are, therefore, an integral and essential part of endemic goiter in man and are due to the same stimulus which excites the thyroid as a whole to hypertrophy.

PREVENTION

1. *Experimental physiology.* In order to present more clearly the experimental basis for goiter prevention, I shall enumerate a few of the more important physiologic and chemical facts on which the practical application is based. (1) The thyroid hormone is a very stable organic compound with iodine first recognized by Baumann in 1895, isolated in crystalline form by Kendall, in 1914, and its chemical structure and synthesis worked out by Harington in 1926 who found it to be a tetra-iodo derivative of the p-hydroxy-phenyl ether of tyrosine. (2) In the developmental stages of all goiters there is a marked absolute decrease in the iodized store which precedes the cell hypertrophy and hyperplasia. (3) Anatomic changes similar to those occurring in spontaneously developing goiter invariably occur in the remaining portion of the gland, when a sufficient amount of the entire gland has been removed. (4) The administration of exceedingly small amounts of iodine in any manner completely protects the remaining portion of the thyroid against compensatory hyperplasia, even after the removal of three-fourths of the gland. (5) the administration of thyroxine will protect against compensatory hyperplasia (regeneration) even after the removal of five-sixths of the gland. (6) Thyroid tissue when autografted in any part of the body exhibits the same reaction to iodine as nontransplanted tissue. (7) If most of the thyroid gland is removed before or in the early stages of pregnancy and rigid precaution is taken to exclude iodine, the young at birth will have enlarged thyroids, as first shown by Halsted in dogs. If, however, iodine is administered under such conditions as shown by Marine and Lenhart, the young at birth will have normal thyroids, and it is possible to obtain alternate litters of goiterous and nongoiterous puppies merely by the administering and withholding of iodine in such dogs. (8) A milligram of iodine given at weekly intervals has been found sufficient to prevent the spontaneous thyroid hyperplasia (goiter) in young dogs. (9) The thyroid gland has an extraordinary affinity for iodine, as has been demonstrated both in vivo and in vitro. In animals, if the iodine store in the thyroid is maintained above 0.1 per cent no thyroid enlargement can occur.

2. *Application.* The first instance in which these facts were utilized on a large scale in the preven-

tion of goiter was in 1909, when Marine and Lenhart demonstrated that iodine added to water in a concentration not exceeding one to a million arrested or prevented the development of thyroid hyperplasia in brook trout. Since then this method or some modification has been successfully applied in the prevention of goiter in sheep, cattle, hogs and poultry. One of the most striking illustrations of its practical value in animal industry is the results obtained in the newly settled Pemberton Meadow valley of British Columbia. In 1916 Mr. John Ronayne, a prominent farmer in this valley, sought my advice through the United States Department of Agriculture as to what could be done to control goiter, since it was practically impossible to rear any animal to maturity on its account. He was advised to use a few milligrams of iodine weekly administered in the food. A year later Mr. Ronayne stated he was able to completely control goiter by this very simple and inexpensive means.

To our knowledge the prevention of human goiter, while it may be carried out just as simply and easily as prevention in the lower animals, was not attempted on any large scale until 1917, when Dr. Kimball and myself began its practical application in the school population of the city of Akron. The plan adopted at that time consisted in the administration of 2 gm. sodium iodide in 0.2 gm. doses, distributed over a period of two weeks and repeated each autumn and spring. It was pointed out at the time that this amount of iodine (approximately 1700 mg.) was excessive and far beyond the needs of the individual or the ability of the thyroid to store it.

These experiments were carried out over a period of two and one-half years and the results were briefly as follows: Of 2190 pupils taking 2 gms. of sodium iodide twice yearly only 5 developed enlargement of the thyroid, while of 2305 pupils not taking the prophylactic 495 developed thyroid enlargement. Of 1182 pupils with thyroid enlargement at the first examination and who took the prophylactic, 773 thyroids decreased in size, while of 1048 with thyroid enlargement at the first examination and who did not to our knowledge take the prophylactic, 145 thyroids decreased in size. Since these results were reported numerous papers have appeared in the European literature confirming and extending these observations. Many plans have been proposed for administering the small amounts of iodine necessary for prevention. These have recently been reviewed by Olesen (Public Health Reports, 1924, vol. 39, p. 45) and in general consist either of introducing iodine into the drinking water, into the soil by means of an artificial fertilizer, in the table salt or by means of iodine-containing tablets and confections.

We are now in the midst of a controversy which not only involves the question of whether goiter prevention in man should be attempted, but to the layman even appears to involve the question of whether goiter can be prevented at all by the use of iodine. I can dismiss any doubts in your minds regarding the second question by saying that goiter in man can be prevented by the use of iodine. Whether it should be prevented, organized society must decide. Undoubtedly much of the disrepute into which goiter prevention has fallen in this country is due to the uncontrolled, injudicious and excessive use of iodine through commercial enterprises, unscrupulous propaganda and the demand for treatment.

The two most important questions to be solved are, (1) how much iodine is necessary for prevention in man, and (2) what is the best means of administering such amounts. Regarding the first question it must be frankly admitted that we have at present very little data of value. The available data bearing directly on this point are as follows: (1) The experiments of Lenhart and myself showed that 1 mg. of iodine given by mouth once a week was sufficient to protect puppies against thyroid enlargement, while living under conditions that regularly caused such enlargement in controls. (2) It was shown that adding iodine to the water supply in the proportion of one part per million completely protected brook trout against goiter. (3) It was found that feeding whole hashed sea fish once a week also protected brook trout against goiter. (4) The observations of Bayard, Hunziker and Klinger in Switzerland would indicate that the administration of 1 mg. of iodine per week would prevent thyroid enlargement in children. These facts clearly indicate that the amount of iodine required for prevention of goiter in man are extremely small, possibly not more than 0.1 mg. daily, that is, a total of nearly 40 mg. yearly.

Undoubtedly the amounts of iodine used in this country in the attempts at prevention have vastly exceeded this. Salt containing 0.01 per cent has been on the market for some years. Salt containing 0.001 per cent, that is, 1 to 100,000, would be more in agreement with our present knowledge. The Swiss Goiter Commission has recommended one part of potassium iodide in 200,000 parts of salt, that is, 0.0005 per cent, and the New Zealand Board of Health has recommended a similar concentration. Crude sea salt contains approximately one part of iodine per million.

Regarding the second question, "what is the best means of administering such amounts of iodine so as to provide a daily or weekly or possibly monthly intake with the total not exceeding 40 mg. annually," many plans have been proposed but none is free at present from objection, and much additional work will have to be done before the best means of administration can be determined. If some means could be devised of providing an annual intake of 40-50 mg. of iodine and the treatment of goiter with iodine completely divorced from prevention, as it should be, I feel certain that goiter prevention could soon be put on a practical basis free from danger.

The greatest objection to goiter prevention is the claim that iodine administration for this purpose has caused and aggravated cases of Graves' disease. There are several reports showing that the prolonged use of iodized salt alone has been responsible. While there is no doubt that the large amount of iodine formerly used in salt in this country was sufficient to aggravate active cases of Graves' disease, still I am convinced that the injury done in this way has been negligible in comparison with that which has been done by the excessive use of iodine in one form or another in the treatment of goiter, either through self-medication or by doctors insufficiently acquainted with the dangers.

Salt is certainly the simplest and most natural means of distributing the traces of iodine required in our food and, if all other artificial means of administration could be controlled, adequate data would soon be available from which to decide the optimum amounts necessary for prevention. There is no doubt that one of the obstacles in the way of applying our present knowledge both in the prevention and treatment has been the difficulty of realizing how small the amounts of iodine necessary for normal thyroid activity actually are, since it is so extensively used for other therapeutic effects in much larger doses. Another difficulty has been that nearly all the experimental work leading up to goiter prevention has been done on animals, where the constitutional anomaly of Graves' disease either does not exist or at least has never been detected and, therefore, the condition of greatest danger from iodine administration could not be studied under controlled conditions.

But if our data on the minimum dosage needed are too limited to attempt universal prophylaxis by such means as iodized salt, goiter prophylaxis may still be undertaken during childhood and pregnancy where the dosage of iodine is relatively unimportant. If limited to these periods only, probably 75 per cent of simple goiter could thus be controlled. For limited prophylaxis several methods are available. The most popular one appears to be the use of tablets containing not more than 1 mg. of iodine, if given at weekly intervals, or not more than 4 mg., if given one a month. Iodostarin, a proprietary remedy, in chocolate coated tablets has been extensively used. Starch-iodine tablets would be equally as efficient and far less expensive.

An objection to any automatic or universal method of prophylaxis is that it takes it away from the immediate control of physicians. On the other hand, limited prophylaxis should be under the control of public health officers. While no plan of limited prophylaxis can be evenly applied or produce uniform results just because of the factor of human variability, it seems more practical to begin in this way but striving toward the ideal of automatic universal prophylaxis with iodized salt.

MALFUNCTIONS OF THE THYROID GLAND

THE BASIC PRINCIPLES UNDERLYING THEIR MODERN TREATMENT

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PART I

The surgeons of the early twentieth century were cognizant of the presence of the gland of internal secretion, known as the thyroid gland, the hyperactivity of which produced endemic and exophthalmic goiter; the hypoactivity, cretinism and myxedema. They knew also of the presence of the parathyroid glands, and of the dire results that followed parathyroid removal. They knew that iodin was present in the thyroid in larger amounts than in other tissues, and that the administration of iodin benefited some cases of goiter. The hormone theory had appeared and the thyroid secretion was considered as one of the hormones. Postoperative myxedema was not uncommon and they knew how to combat it with thyroid extract and iodin. The skillful work of Theodor Kocher was establishing thyroidectomy. Medical treatment and sympathectomies were being abandoned and, with reservations, partial thyroidectomy was advocated, the mortality ranging from 4 to 12 per cent.

Leischner, in 1907, showed that the spasm of parathyroid tetany could be abolished upon the injection of an extract of the gland or upon feeding it.[1] MacCallum and Voegtlin, in 1908, relieved tetany by the administration of calcium salts. The practice of thyroidectomy was well established by 1910.[2]

The past seventeen years have seen the standardization of the thyroidectomy. The diagnosis and differentiation of the malfunctions of the thyroid have been placed upon a sound physiologic basis and medical, preoperative and postoperative treatment have been so advanced that now, with rare exceptions, sufferers from malfunctions of the thyroid may be restored to normal health. This article treats principally of the results of the past seventeen years.

THE FUNCTION OF THE THYROID GLAND

So far as is known, the function of the thyroid gland is the production and delivery of thyroxin. It transposes the molecules of iodin from the compounds of iodin that enter the gland into the iodin of thyroxin.

The action of thyroxin in the tissues is not known. Plummer[3] considers it as a catalytic agent, Crile[4] as an accelerator of function and conductivity in the electrochemical mechanism, man. The phrases appear to be synonymous.

EMBRYOLOGY

From the vitelline sac in the very early embryo, blind entodermal tubes are projected cranially and caudally into the head and tailfolds, respectively known as the foregut and hindgut. These tubes project until they come into contact with the ectodermal cavities of the head and tail, with which they fuse, forming the pharyngeal and cloacal membranes (fig. 1).

It is slightly below this fusion in the head-fold at about the 1½ mm. stage that the thyroid evagination appears.[5] In about the 2.5 to 3 mm. stage, the pharyngeal membrane is perforated and the external cavity and pharynx become continuous[6] (fig. 2). In the 4 to 5 mm. stage five pairs of pharyngeal pouches are present, developed from the lateral wall of the pharynx, the fifth pair being rudimentary[5] (fig. 3).

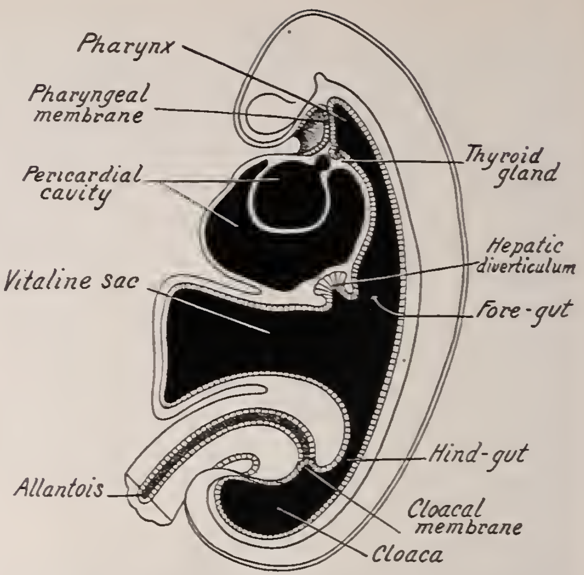

Fig. 1. Diagramatic illustration of a sagittal section of a 1½ mm. embryo, showing the pharyngeal and cloacal membranes and the appearance of the thyroid bud (modified from Prentiss).

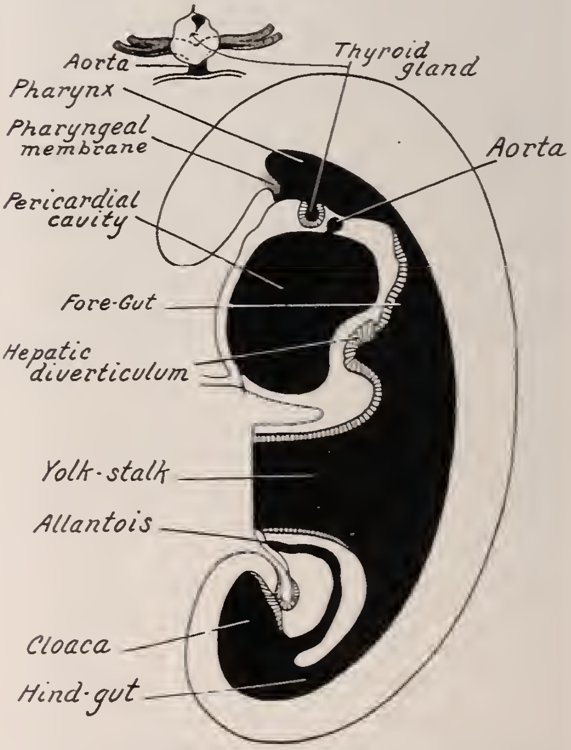

Fig. 2. Diagramatic illustration of a sagittal section of a 2½ to 3 mm. embryo. The pharyngeal membrane is imperforate and the oral and pharyngeal cavities are continuous. The thyroid bud is shown pushing downward in front of the aorta. (From Prentiss.) The insert is a diagram of an anteroposterior view at this time, showing the thyroid gland lying over the bifurcation of the large vessels of the head and neck, and intimates the manner in which these large vessels are pulled upward on the lateral sides of the gland with the elongation of the embryo.

The anlage of the thyroid protrudes from the front of the pharynx between the first and second pair of pharyngeal pouches. The growth proceeds downward and forward, as diagramtically illustrated by Norris[6] (fig. 4). "Considerable variation occurs. The downgrowth may be solid (c), possessed of a hollow stalk (d), or be double (e). As the stalk connecting the gland with the pharynx elongates, the condition as shown in g, h or i may be present. At from the 4 to the 7 mm. stage, the stalk separates from the gland in any of the various ways shown from j to q. If division takes place near the pharynx, leaving a large amount of

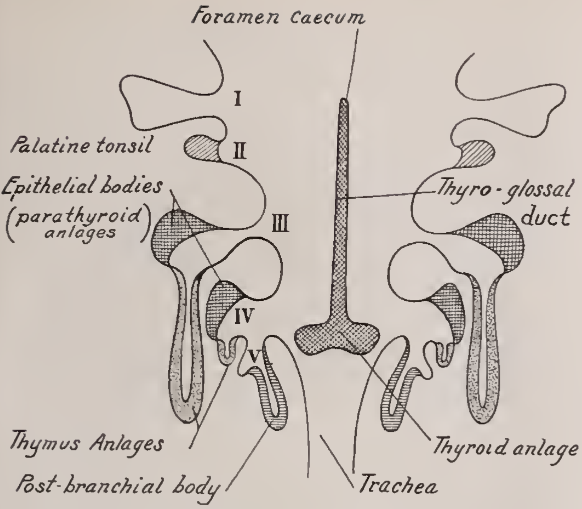

Fig 3. Diagramatic illustration of a coronal section of a 4-5 mm. embryo, showing the five pair of pharyngeal pouches, the third and fourth of which later form the parathyroid bodies. The analage of the thyroid is shown protruding from the front of the pharynx between the first and second pair of pharyngeal pouches. (From Prentiss.)

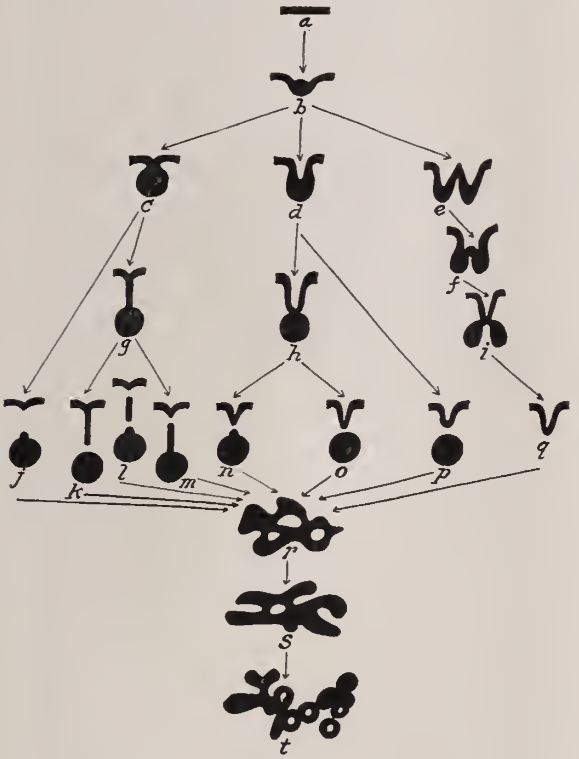

Fig. 4. Diagramatic illustration (from Norris), showing the possible variations in the development of the thyroid which accounts for its anomalies.

tissue of the stalk which does not atrophy in association with the thyroid body, a pyramidal lobe may be present.[7] If division takes place near the gland, leaving a large amount of tissue which does not atrophy connected with the pharynx, lingual rests or suprahyoid bodies or the so-called thyroglossal duct may be present.

"After separation the gland forms closed cavities (r) that later open into the periphery of the gland anlages (s) and follicular cavities begin to appear in their walls (t)." Colloid formation does not take place until after birth.[7] At birth the thyroid comprises about .1 per cent of the total body weight.[6]

The diagram of Norris accounts for the various anomalies. The pharyngeal end of the stalk is usually absorbed but may persist as the lingual duct, opening into the foramen cecum. When the pyramidal processes are double, they usually extend to each lateral lobe and the isthmus is absent. The pyramidal process usually connects with the left lobe. Occasionally there is but one lobe. Development of the thyroid may be arrested until the hyoid bone has formed, in which case the thyroid anlage may be retained above it or, if the hyoid bone develops before the absorption of the thyroglossal tract, it may grow around this tract, the thyroglossal duct running through the middle of the bone. If not, the thyroglossal duct will go either directly above or directly below the bone, making it necessary in dissecting out a thyroglossal duct cyst to remove a section of the hyoid bone. The thyroglossal duct cysts are formed by failure of the physiologic absorption of the thyroglossal duct with persistent secretory activity, the cyst formation taking place when drainage of the secretion is interfered with. When a thyroglossal duct persists, it may at any time become infected. The upper portion of the thyroglossal duct has a squamous epithelial, the lower part a ciliated epithelial lining.

Aberrant thyroid tissue may be found at any point or points along the course of progress of the embryonic thyroglossal duct.[8] The thyroid is not present in invertebrates. It reaches its highest state of development as the bilobed gland of mammals. The parathyroids develop separately from the third and fourth pharyngeal pouches (fig. 3).

ANATOMY OF THE THYROID

The normal thyroid gland is a bilobed, multilobular gland, one lobe lying on each side of the trachea, below the cricoid and thyroid cartilages, the lobes being conencted by an isthmus of thyroid tissue. The center of the isthmus, when the neck is flexed, lies immediately under the sternal notch produced by the junction of the clavicles with the manubrium. Each lobe is pear-shaped, with the inner side of the stem portion paralleling the lower later beveled side of the thyroid cartilage, from

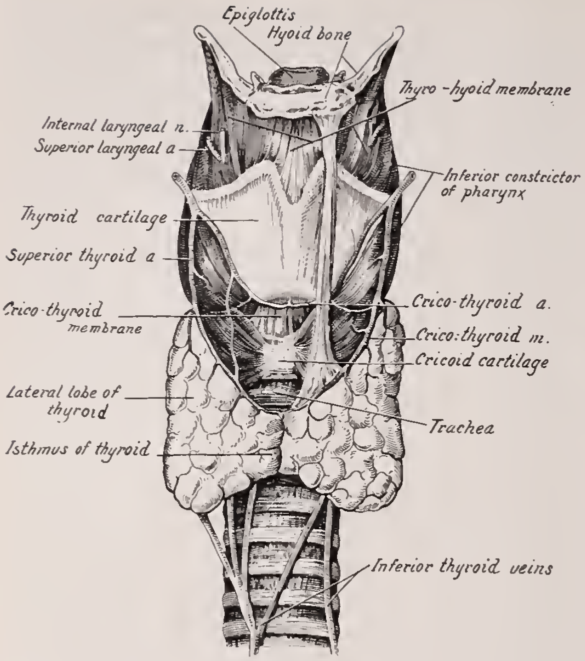

Fig. 5. Illustration (from Deaver) of the relations of the thyroid to the trachea, larynx and associated structures.

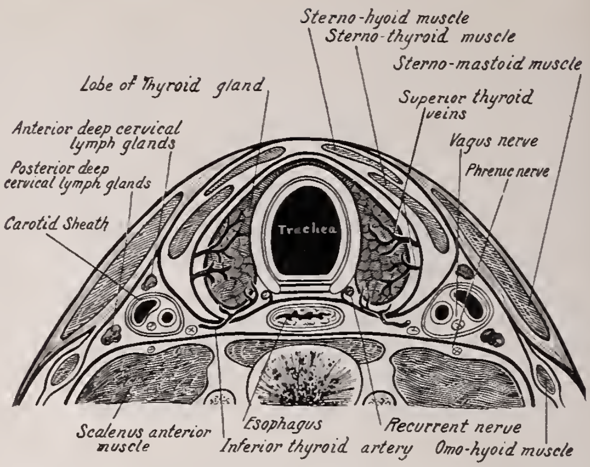

Fig. 6. Diagram of a cross-section through the neck at the approximate center of the thyroid gland, showing its relation to surrounding structures. (From Cunningham.)

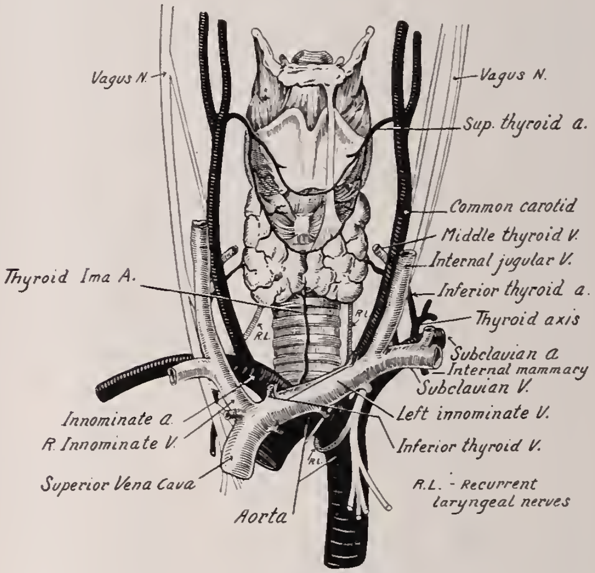

Fig. 7. Diagram showing the relation of the thyroid to its blood supply and to the recurrent laryngeal nerve. (Reconstruction from Deaver.)

which it is separated by the inferior constrictor muscles of the pharynx (fig. 5).

Over the thyroid anteriorly from without lie the skin, the superficial fascia, the platysma, the anterior jugular veins, the manubrial attachments of the sternocleidomastoid muscles, the sternohyoid and the sternothyroid muscles, and the double capsule of the thyroid (fig. 6).

The thyroid lies in horseshoe formation around the anterior and lateral sides of the trachea, fitting closely to it. On the lateral sides of the gland, outside of the lobes, course the internal jugular veins and the common carotid arteries within the carotid sheath (fig. 7). The thyroid hangs in the upper open portion of a "Y" formed by these vessels and their main arterial and venous trunks.

The gland is covered with a double delicate capsule of connective tissue, which separates posteriorly, one part surrounding the thyroid, the other enclosing the pharyngeal structures (fig. 6). Posteriorly the lateral lobes of the thyroid lie upon the fascia over the prevertebral muscle. The lower border of the gland is blunt and contains in its center a recession where the isthmus occurs. The upper border is "U" shaped, having a flattened base where the isthmus occurs. Between this flattened base, formed by the isthmus, and the cricoid cartilage surrounding the trachea is a small space through which the trachea may normally be seen. The thyroid is suspended in this position by the adherence of its own capsule to the pretracheal fascia and by ligaments which suspend its medial and posterior portions from the cricoid and thyroid cartilages. These ligaments are known as the suspensory ligaments of the thyroid. They may appear fused as one sheet or as two sheets on either side.

The thyroid gland has been considered as the most vascular organ of the body. The large vessels which enter it are comparatively larger than those which enter other organs. Above in its stem-like portions (the superior poles) enter the superior arteries (the most constant vessels of the thyroid) and veins, branches of the common carotid and internal jugular veins respectively. In the central portion, from the lateral sides of the gland, the middle thyroid veins join the internal jugular veins.

The subclavian artery, from a point laterally beyond the branching off of the common carotid artery on its superior posterior side, gives off the thyroid-axis. This axis is diametrically opposite the branching from the subclavian artery of the internal mammary artery. The thyroid-axis shortly after its emersion from the subclavian artery divides into three portions, the suprascapular and transversalis colli arteries, running backward and laterally across the shoulder, and the inferior thyroid artery, running centrally toward the thyroid which it enters at about its inferior lateral corner. The inferior thyroid artery gives off two branches, one going upward into, behind and over the gland, the other going medially into, behind and over the gland. The inferior venous return converges at the lower pole, forming a trunk which enters the innominate vein near its union with the superior vena cava. There is usually but one inferior thyroid venous trunk, though at times there may be two separate veins. Somewhat anomalous vessels are often found, the ima artery and vein, following up the trachea from the main arterial and venous trunks to the base of the thyroid near its isthmus, there usually being but one artery or vein or one of either.

The carotid arteries furnish but one vessel to the thyroid on either side, the superior thyroid artery. The internal jugular vein furnishes the superior and middle thyroid veins. The inferior thyroid artery is a switch-back from the subclavian artery. The inferior thyroid veins are given off from the most dependent portion of the gland and run directly back into the large vessels below the base of the neck. The ima artery and vein are not constant and are branches from the large vessels below the base of the neck. The large vessels surround the gland, giving off small vessels to its interior. The veins of the thyroid are said to be without valves. The anastomoses of the thyroid gland are luxuriant. While the foregoing description covers the normal gland, many variations are found and, following increase in the size of the gland, nearly any possible arrangement of vessels may be found.[6]

When the muscles are retracted, exposing the anterior aspect of the gland, the thyroid cartilage is seen above the alae of the thyroid. Below the thyroid cartilage on the trachea is the cricoid cartilage, from which diagonal fibers run to the inner and posterior sides of the thyroid. These are the suspensory ligaments. They are supplied independently by a branch from the superior thyroid artery. This is known as the cricothyroid artery. It follows down the suspensory ligament and enters the gland near the lower attachment of the suspensory ligament to the gland. If a pyramidal lobe exists, it comes down the trachea over the thyrocricoid ligaments, usually attaching to the left lobe, and carries with it this cricothyroid artery. Sometimes, though seldom, there are double pyramidal lobes. Then the isthmus usually is absent.

The normal isthmus is a band of thyroid tissue 2 cm. in width and .5 cm. thick, passing in front of the trachea over the second and third tracheal rings, connecting the lateral lobes of the thyroid. Abnormally, it may cover several tracheal rings and be very thick. The blood vessels anastomose freely across the isthmus. The normal lateral lobe extends from halfway up the posterior border of the thyroid cartilage down to the sixth tracheal ring.

The sympathetic nerve supply of the thyroid gland is derived from the middle or inferior ganglia of the cervical sympathetic system, the sympathetic fibers accompanying the blood vessels through the fibrous stroma, ending at bases of the gland cells. Some nerve fibers are said to pass to the gland from the inferior and external laryngeal nerves.[6]

The vagus nerve passes through the neck within the carotid sheath, lying on the carotid artery between and behind the carotid artery and the internal jugular vein. It enters the thorax behind the large veins and in front of the subclavian arteries. Immediately after it crosses the subclavian artery on the right side and the aorta on the left, it gives off branches, the recurrent laryngeals, which pass around behind these vessels, and backward and inward to the trachea, where they follow the depression between the trachea and esophagus upward into the larynx (figs. 6, 7 and 8). It furnishes some enervation to the thyroid gland but is of importance principally as its anatomic position endangers it from the growth of the gland or from trauma during operation.

The normal gland is pinkish yellow in color. It is of firm consistency. It has a lobular appearance, its lobules being formed by constriction of the capsular trabeculations with their accompanying meshes of blood vessels, nerves and lymphatics. On sectioning, these lobules are found to be composed of small vesicles and stroma, supported by a network of connective tissue which is continuous with the filmy fibrous capsule which surrounds the gland. These small vesicles, lined with cuboidal cells and containing colloid material, appear to be continuous

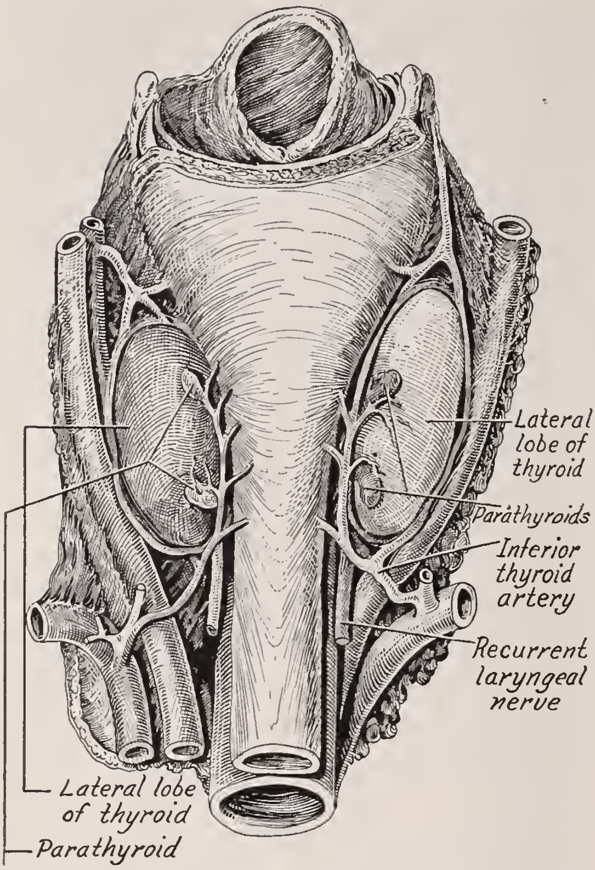

Fig. 8. Drawing viewing the thyroid from behind, showing the relations of the thyroid and parathyroids. (From Lewis, after Halsted and Evans.)

with the lymphatic system that drains forward and laterally, passing variously into the cervical lymphatic system.

The anomalies of the thyroid are many. From a study of the embryology of the gland, the imagination cannot exceed the variety of anomalies to be found (fig. 4).

THE PARATHYROID

The parathyroids are small, flattened, lentil-shaped bodies, situated two on a side in the loose connective tissue (fig. 8). The superior parathyroid gland on each side is located posteriorly about midway between the poles of the thyroid, at the level of the cricoid cartilage, close to the wall of the esophagus, usually outside of the thyroid at its posterior edge, though it may be within this gland. The inferior thyroid artery and the recurrent laryngeal nerve pass upward medially and in front of the superior parathyroid, the superior parathyroid bodies usually being found where the end branches of the inferior thyroid artery enter the thyroid gland.

The superior parathyroids are fairly constant, though their size and location may vary.[9] The inferior parathyroids are less constant. They always lie in front of the inferior thyroid artery. They may be either posterolateral or anterolateral to the thyroid. They are usually about opposite its lower end. As a rule, they are removed from the gland itself, embedded in fat and loose connective tissue. They may be as low as the fourteenth tracheal ring. Because of their inconstancy of location, they are seldom distinguished. The parathyroids are rarely symmetrically located. Their dimensions average 6x4x2 mm. Their color differs from that of the thyroid, being greyish, yellow or brown, and not having the pinkish hue of the thyroid.[9]

They are smooth, shiny and vascular, more firm than lymph nodes, less elastic than thyroid tissue and less flabby than fat. Rarely three parathyroids are found on a side. Their blood supply comes from the parathyroid artery, a branch of the inferior thyroid. Pool has described a parathyroid artery coming off the superior thyroid artery. The nerve supply to the thyroid and to the parathyroids is probably entirely sympathetic.[9]

HISTOLOGY OF THE THYROID GLAND

Upon closer examination the thyroid capsule is found to be composed of two parts, an outer which strips readily, and an inner part which is quite adherent to the gland. It is the outer capsule that surrounds the trachea and larynx. The inner part traverses the gland and marks out its numerous lobules.

Upon microscopic examination, the normal thyroid will be found to consist of a net-like framework of connective tissue, accompanied by the vessels, lymphatics and nerves, within the meshes of which are round or oval vesicles, alveoli or acini. The alveoli are lined with cuboidal epithelium. The more regular the size of the alveoli, the more normal is the gland. The alveoli are filled with a colloid, amber colored, viscid, globulin-containing substance, the purpose of which is to act as a vehicle for storing the active principle of the gland, thyroxin. Each alveolus is surrounded by networks of blood vessels and lymphatics. Occasionally between alveoli will be found groups of immature thyroid cells. These appear to be reserve cells, and upon physiologic call they may develop, or attempt to develop into active alveoli. They have been called "thyroid rests" or "fetal rests" (fig. 9).

The thyroid also contains, interspersed in its network substance, lymphoid cells and channels. The cells lining the alveoli are low cuboidal in shape. High cuboidal or columnar cells indicate an effort

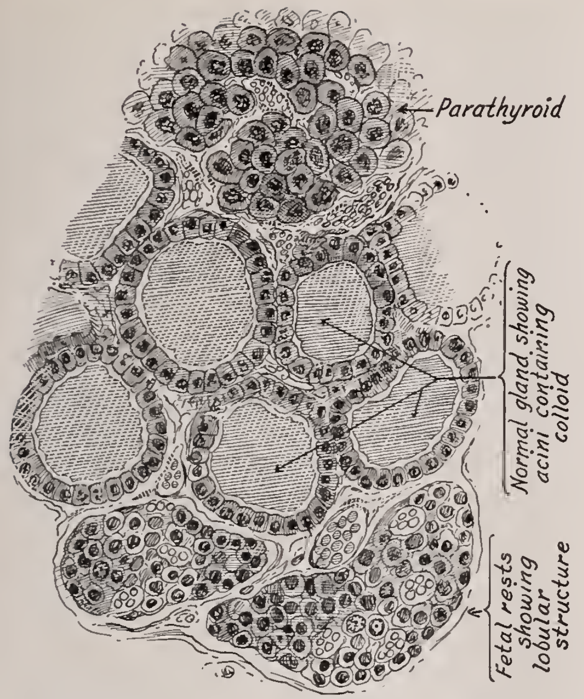
Parathyroid
Normal gland showing acini containing colloid
Fetal rests showing lobular structure

Fig. 9. Composite diagram illustrating the normal histology of the thyroid gland.

on the part of the gland and are signs of pathologic processes. The cells contain spherical nuclei and nucleoli. The nuclei are located on the basal end of the cells. The cytoplasm of the cell may contain droplets of fat, granules or colloid material. When the colloid within the acinus or alveolus contains granules or less completely degenerated cells, vacuolets or occasionally droplets of fat, these are usually considered as evidence of degeneration.

The alveolus is both a secreting and storing unit. The cell produces colloid and thyroxin. The average body needs are supplied by the cell secreting directly back into the bloodstream. The colloid-containing cell-enclosed area is a reservoir for storing and perhaps for concentrating the thyroxin-containing colloid for moments of emergency, the function closely resembling that of the gallbladder.

THE HISTOLOGY OF THE PARATHYROID GLAND

The parathyroids are small, lentil-shaped bodies, enclosed in a fibrous capsule, honeycombed by fibrous meshes which tend to divide off groups of cells, and form the support for accompanying blood vessels and nerves (fig. 9).

Several types of parathyroid cells have been described, differing in the manner in which they receive stain, in their size, shape and formation. Thompson, in a study of infant parathyroid glands, found that these differences did not exist.[9] As has been suggested by many, it is very possible that these cells are variants of the same type of cell, the differences in their appearance depending upon their state of activity, their state of growth and by their proximity to blood supply. These cells have been described as homogeneous, appearing in columns, and forming acini. The homogeneous cells appear to be surrounded closely by blood vessels. The columnar cells appear to merge into each other and to be surrounded by blood vessels only on the edges of the columns into which they are formed. The acinar-shaped cells are usually larger than the other cells and form acini, containing colloid. This colloid does not resemble the colloid of the thyroid in that it is iodin-free (Schafer). The cells receive from and secrete into the blood stream. Some of the cells are filled with oxyphil granules. There does not appear to be any relation other than geographic between the thyroid and the parathyroid. The importance of the parathyroids, so far as diseases of the thyroid are concerned, lies in their anatomic position, lest they be damaged or removed. (To be Concluded)

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RAPID METHOD FOR REMOVAL OF PLASTER-OF-PARIS CASTS. David H. Shelling and Morris D. Cohen, New York (*Journal A. M. A.*, July 21, 1928), describe a rapid method for the removal of plaster-of-paris casts. With an ordinary cast knife, a superficial cut is made on the cast as a marker. A 25 per cent solution of sodium or potassium citrate is dropped from a dropping bottle along the outlined pattern. The cast is softened at once and is then cut with an ordinary scalpel or cast knife. The advantages of this method are: 1. The ease and rapidity with which a cast may be removed. 2. The elimination of elaborate cast-cutting instruments. 3. The ease and rapidity with which fenestras of any size or shape may be cut. 4. Its inexpensiveness. 5. The absence of chemical injury to patients or instruments.

LOCAL ANESTHESIA IN MAJOR SURGERY*

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Present-day medicine advances, as always, in giant strides. Improvement and simplification in therapeutic and operative technic have kept pace with scientific research and investigation, so that the marvel of yesterday is the commonplace of today. Familiarity with the newer things inspires a confidence and a sureness unknown only a short time ago. Insulin in diabetes; the antitoxins in diphtheria, scarlet fever and erysipelas; the quartz light; the high frequency currents in their myriad applications; the marvellous developments in radiology; these are but a few of the many tremendous changes and advancements already made and continuously being made in all fields of medical practice.

Means and methods of rendering operative procedure painless have undergone changes almost as radical as those suggested above. It is, indeed, a great step from the uncertain, haphazard ether cone to the definitely measured, accurately controlled gas-oxygen-ether-ethylene apparatus now in general use in standard hospitals. And with the improved technic in general anesthesia has come development in the related field of local anesthesia as radical, as marked and even more marvellous. As in any procedure deviating from the usual, the beginnings of local anesthesia were fraught with uncertainty and great difficulty. Technic varied, results varied even more, and it is only within the last very few years that methods and technic, and therefore results, have become practically standardized.

All honor is due to the pioneer in any field, to the pilgrims, to the early settlers in our own great Northwest, to Lister and Pasteur, to Walter Reed, to the Curies; and, in this particular field, to Braun, Pauchet, Kulenkampff, Jonesco and Crile who, twenty years ago, were employing local anesthesia rather extensively.

These and other investigators early learned that not only was it important in any surgical procedure to avoid pain, but that the elimination of shock was equally important. Crile,[1] indeed, believes and has consistently taught that the degree of trauma is relatively immaterial so long as shock can be prevented or neutralized; hence his development of the anoci-association theory, the application of which has, in his master hands at least, revolutionized our conception of surgical shock and its prevention.

As in any new procedure or method, the enthusiasts have been somewhat carried away by their enthusiasms, while the ultraconservatives have "viewed with alarm," openly criticized or ridiculed the adventurers. It was learned early in the investigations that any surgical work performed under local anesthesia must be done gently, with a minimum of handling of the viscera especially; that it must be done rapidly, in order not to exceed the duration of the anesthesia; and with a minimum of trauma to the parts; and that, therefore, the operator must possess or develop a quick, sure, gentle technic. These are rules which must never be violated by one who expects to do extensive or successful work by this method.

HISTORY AND DEVELOPMENT

The rise and development of the now extensive use of local anesthesia is best portrayed by a resume of the work of those who have been instrumental in its adoption. Le Normant[2] was one of the early, extensive users of local anesthesia of the brachial plexus, which method had previously been introduced in Germany by Hirschel and Kuhlenkampff and by Crile in America, although their methods varied widely, as did their early results. Kappis[3] developed an exacting and successful technic for paravertebral anesthesia, as did Finsterer.[4] In 1913 Regnault[5] reported 406 herniotomies and Berard 17 gastrotomies under local anesthesia, while Lynch[6] gives details of his method of sacral anesthesia. In 1915 Harris[7] reported exhaustively on his large experience with nerve blocking in some 234 cases and decided that it is the ideal method in herniotomy and in most other major procedures, except where there must be traction on the mesentery.

Farr[8] used the local method in several hundred cases and has done much excellent work toward the development of a perfected technic, especially with his gravity apparatus. Vignes[9] used local anesthesia in 198 major cases, the great majority of which he found satisfactory, while Holden[10] reported on 229 cases. He believes the method to be ideal in hemorrhoids, hernia, perineorrhaphy and in selected cases for amputations, appendectomy and cholecystectomy. Burger[11] gives a definite review of the scope of local anesthesia, emphasizing the need of a generous use of the solution in all parts explored, while Cottam[12] reports a large series of major operations and says: "In every instance the operation was devoid of shock and unaccompanied by any complication due to the anesthetic."

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* Read before the Thirty-eighth Annual Meeting of Washington State Medical Association, Tacoma, Wash., Aug. 29-31, 1927.

In 1919 Farr[13] reported 77 major operations on children under local anesthesia, in only seven of which it became necessary to supplement the local with general anesthesia, thus proving that in children at least the psychic element is none too important. J. Wiener[14] reported 250 major operations under local anesthesia, giving the details of his excellent technic. He emphasizes, as many do, the importance of selecting an anesthetic solution which is relatively nontoxic, lasting in effect and causing the minimum of local disturbance. He stresses also the importance of a careful method of operating, especially great gentleness in handling all tissues. Ochsner, in commenting on this paper, states that Wiener's technic demonstrates that "there is scarcely an operation in the entire field of general surgery which we have not been able to perform satisfactorily under local anesthesia by following the plan laid down in this (Wiener's) article."

The largest published series we have been able to find in the literature is that recorded by Rood,[15] of London, who reports 8,000 cases of spinal anesthesia (spinal block), with only two deaths. The chief dangers of this method to which he directs attention are interference with respiration, sudden fall of blood pressure and vomiting. His conclusions, in view of his own very large series and of some 2,000 from other clinics, are: This method is past the experimental stage; it is a recognized method of inducing surgical anesthesia; it is not of universal applicability; it has its special dangers and difficulties, but when used in its proper sphere it has great merit and is a very valuable method.

Achard[16] reports 413 cases operated upon under spinal anesthesia. The only immediate byeffects reported in his series are vomiting and occasional syncope; and the only troublesome aftereffect of late occurrence is headache which he found somewhat common. In general, he believes the method is sound, practical and adaptable to an extremely wide range of major surgery.

Noehren,[17] in a very carefully worked out investigation, makes a plea for more extensive use of local anesthesia. His tabulation of pain sensation of the tissues encountered is very instructive.

No sensation	Slight sensation	Acutely sensitive
Thoracic organs	except to traction	Skin
Abdominal organs	except to traction	Pleura
Visceral peritoneum	Messentery	Parietal peritoneum
Kidney and ureter		Oroficial mucosae
Thyroid gland		
Cervical lymphatics	Connective tissue	Blood vessels
Esophagus		
Trachea	Muscles	
Brain and dura		
Bone	Fascia	Periosteum
Cartilage		Perichondrium
Neoplasms		Tendons
Granulation tissue		

Pain sensation (noehren)

This shows again, that abdominal operations generally require anesthesia of the wall and mesentery only; that bone itself, cartilage, the thyroid, the brain, glands in general and neoplasms can be manipulated painlessly, provided their connective tissue investment is anesthetized; and thus many patients may be operated upon under local anesthesia who would succumb if general anesthesia were used. This splendid paper is one of the strongest pleas we have found for the perfection of the important technic of local anesthesia and its extended use.

Griffiths[18] has made a careful study of the difficulties of local anesthesia before, during and after its use, making a plea for gentleness in handling the parts invaded. Delaup [19] reports that he has personally performed over 5,000 operations under spinal block, and he has naturally worked out a splendid technic. He says this method is not applicable to every case and that they should be carefully selected, although he believes that it is generally more successful in the cases to which it is adapted than is general anesthesia. Dehelly, of Paris, has also demonstrated, in reporting an enormous number of cases, that "with careful application, spinal anesthesia is effective and safe for most operations on the lower extremities, the lower abdomen and the pelvis."

In reviewing the surgical progress of the year 1921, Ochsner[20] says: "In anesthesia there has been a strong tendency to increase the use of ½ and 1 per cent novocain. Spinal anesthesia (spinal block) has gained many friends, especially for operations on aged patients, for operations in portions of the body controlled by nerves from the lower portion of the spine."

In discussing the present status of local anesthesia, Bratrud[21] remarks that definite requirements must be met to insure success; that postoperative complications are fewer than with general anesthesia; that recovery is more certain and more rapid; that disadvantages are largely unreal; that the so-called "normal mortality" can be reduced; and that increased knowledge, experience and enthusiasm insure the future of this method.

Zimmerman[22] again emphasizes the importance of rigid and complete analgesia and the entire confidence and cooperation of the patient throughout the operation. This, he rightly maintains, is secured largely by the skill of the surgeon in making his "point of beginning" absolutely silent and his handling of tissues and instruments, quiet, swift, sure and gentle.

Southam[23] of England, where spinal anesthesia has been none too popular, makes a plea for its extended use, especially in urgent surgery in elderly patients, in whom general anesthesia is often accompanied by serious risks. He mentions a long list of surgical conditions where this method is particularly applicable and says that often, "where the condition is so bad as almost to negative any operation, spinal anesthesia enables one to be safely undertaken."

Ryan[24] has adopted the anoci-association method of Crile, believing that it has great advantages over either general or local anesthesia used alone. Fite[25] has been using local anesthesia for six years and has widened his scope of the method until he now uses it in fully 50 per cent of his major work. Platou[26] discusses at length the Kulenkampff brachial plexus block for operations on the arm. This method, he believes is entirely safe and practicable.

Jonesco[27] is one of the real pioneer enthusiasts in the field of local anesthesia. In this particular report he details his altered technic for spinal anesthesia and believes it may be used for any major procedure on the body, from the neck downward. He now uses stovain with caffein added as a respiratory support. Jonesco finds that he experiences no medullary symptoms, no respiratory distress and has often seen patients in profound shock actually "resuscitated." He reports fully on his exceptional series of 1136 so-called "high anesthesias" and 3880 "low anesthesias," without mortality or serious sequelæ, either immediate or remote. His Roumanian colleagues also report 135 "high" and 10,298 "low" anesthesias, with only two deaths. This is a most remarkable, inspiring and instructive report.

In October, 1922, the writer presented a paper before the Inland Empire Medical Society on "Local Anesthesia in Appendectomy," stressing the applicability of this method in selected cases; and in December, 1925, a review of the status of the method in general surgery, before the Whitman County Medical Society.

Babcock[29] made a thorough search of the literature in spinal anesthesia up to 1923, and found something over 15,000 cases reported. His conclusions, from a study of this great mass of material, are: That it is very valuable for operations below the diaphragm; that often it may advantageously be combined with light general anesthesia; that it should not be used in patients with a marked hypotension; that, if used indiscriminately, a mortality of one in 500 may be expected, while if the cases are carefully selected, the mortality does not exceed one in 10,000; that it has not yet been developed to the point of safety for work above the diaphragm; and that special skill and care are required for its use. Tytgat[30] also states that it is the method of choice for operations below the diaphragm; that serious mishaps are not more frequent than with general anesthesia; and that scrupulous attention to technical details is essential to success.

At the 1925 session of this Association in Seattle, Lundy, of the Mayo Clinic,[31] gave a splendid review of the local anesthesia problem, with especial reference to the work at Rochester. The conclusion the writer drew from his report was that about 40 to 50 per cent of major operations were possible, in Lundy's opinion, under local anesthesia; and that paravertebral block did not seem to be working out well up to that time, except with the routine addition of gas-oxygen inhalation.

The conclusions of Takats[32] in a careful review of the subject, should be particularly emphasized; namely, that there is no rivalry between local and general anesthesia, but one should complement the other and there are definite indications and contraindications for the use of each, or for a combined use. He also stresses the importance of the time element involved in the proper induction of local anesthesia, although the loss of time as at present encountered he hopes will inevitably be overcome. He is the one writer discovered in this investigation who is absolutely opposed to spinal block, except for some operations upon the lower extremities; whereas practically every other writer at present believes it is applicable to surgery in general, up to the nipple-line.

The importance of entire cooperation on the part of the patient appeals to Wood[33] in his very practical review of the matter. He is markedly conservative and believes that local anesthesia alone generally fails in intraabdominal work, for the reason that while the abdominal wall can readily be anesthetized, any manipulation whatever within that cavity is certain to cause pain. Otherwise, he believes that in any case to which the method is adapted, its value cannot be overestimated. He somewhat confuses his use of terms as applied to infiltration, field block and nerve block. Minchew[34] makes a point of the necessity for hospitalization of all cases to be operated upon under local anesthesia and of a thorough technic and exact cooperation on the part of the operator, patient and surgical team, the case being treated as strictly surgical at all times.

No known method of anesthesia is without some danger, although it is conceded that the risk with local is generally slight. It is the part of good judgment, however, to bear constantly in mind that fatalities have occurred even with the most careful application and the employment of the least toxic solutions. The special committee of the American Medical Association, appointed to study the toxic effects of local anesthetics, reported at the 1924 meeting that they had found forty-three deaths attributable to these solutions and which had never appeared in the literature. According to Nayer,[35] twenty-six of these were due to the use of cocain and two to novocain, a very significant finding. Eves[36] also reminds us that even the mildest of the local anesthetic solutions are somewhat toxic and he outlines four fatal cases, not previously reported, including one of his own. He has been so deeply impressed by these facts, that he concludes, "Except in scattered instances, ether is the safe anesthetic."

In one of his later papers Farr[37] again demands speed, accuracy, thoroughness and gentleness as well as his "surgical strategy" and the avoidance of all complicated methods. He uses chiefly a free and copious infiltration, rather frequently a full field block and rarely a nerve block by the paravertebral method. When indicated in intraabdominal work, he prefers splanchnic anesthesia by the direct route, under full vision.

Sweek[38] repeatedly mentions the necessity of a competent "psychoanesthetist, whose duty it is not only to induce the local anesthesia but to support and comfort and encourage the patient and secure his cooperation. He also infiltrates the splanchnics by sight after the abdomen is opened. He outlines his chosen technic in most of the common surgical procedures and finds that he is generally successful in completing them under local anesthesia alone. He occasionally adds gas-oxygen for a hypersensitive patient.

Hunt[39] confines his report to local anesthesia in goiter. In 548 surgical goiters he found a mortality of five cases, of which three occurred in 108 cases under ether, one in 306 cases with local alone, and one in 134 combined cases. Therefore, he has entirely discontinued the use of ether in these cases and employs only local anesthesia with the occasional addition of light gas-oxygen narcosis.

Local anesthesia is especially suited to operations upon the thyroid and possesses great advantages over general anesthesia, according to Wathen,[40] in prevention of injury to the recurrent laryngeal nerve, of postoperative pulmonary complications and of vomiting. It also places less burden on the damaged heart and kidney and increases the number of cases which may safely be operated upon and lessens the mortality. Bryson,[41] in a concurrent report in the same journal, discusses the indications and limitations of local anesthesia in general surgery and urges all operators to give the matter careful thought and study, with a view to extending its use.

Gellhorn[42] suggests the use of local anesthesia in gynecologic and obstetric operations. He has had excellent results in curettage, amputation and repair of the cervix, perineorrhaphy and fistulæ; also he is a strong advocate of the field block method to hasten and render less painful the second stage of labor and as a prelude for episiotomy and in cesarean section.

Brunkow of Portland[43] calls attention to the adaptability and practicability of the local anesthesia method and described what he believes to be the proper equipment, personal and mechanical, for successful work in this field. He lays particular stress upon the importance of the "psychoanesthetist," as suggested by Farr. He is convinced that the general surgeon, even in the smaller hospitals, can and should use local anesthesia extensively, skillful technic rather than complicated apparatus being the essential requirement.

INDICATIONS AND CONTRAINDICATIONS

From the foregoing review of the current literature of the subject, it is established that local anesthesia is past the experimental stage and is an accepted procedure. It is equally plain that it has its indications, which are many and positive, as well as certain contraindications. The following conditions furnish a positive indication for the selection of local rather than general anesthesia: Organic heart lesions; acute pulmonary infections, such as pneumonia, or chronic affections like tuberculosis; advanced age; profound shock from severe trauma; marked acute sepsis; and, in general, any of the very many conditions which would make a general anesthesia questionable or frankly dangerous.

Some of the enthusiasts, especially abroad, state that they confidently expect soon to adopt regional anesthesia to the exclusion of the inhalation methods. It is generally conceded, however, that this is allowing enthusiasm to sway judgment too far; for undoubtedly each method has, and will continue to have, a definite field of application and neither can or should exclude the other, even if such a condition were possible or desirable.

Contraindications to any set procedure may be positive or only relative. The use of the uterine curette is often imperative, but it is not used within the pregnant uterus. Clean-cut removal of the appendix may be desirable in a certain case, but surgical judgment would not admit of an extended search for that appendage in the presence of a general suppurative peritonitis. It is generally agreed that local anesthesia should not be used, if the patient is strenuously opposed to the method or simply "does not want to know what is going on"; except, of course, in the presence of one or more of the definite, positive demands for its use. As a rule it should not be attempted in children of an age when they understand something of what is going on, if they are naturally combative or if they cannot or will not cooperate with the surgeon for the success of the undertaking. In older children and in the very young it may generally be employed with success. The demand for a quick beginning and a very rapid termination of the operation in hand may constitute a definite contraindication for local anesthesia; for the method is actually considerably slower than general anesthesia, even in expert hands.

APPARATUS

"Of the making of books there is no end," and this is almost equally true of highly specialized and often greatly complicated surgical apparatus, although frequently cleverly designed and splendidly made for a certain definite procedure. However, in the realm of local anesthesia, as in many others, the desire for marked specialization has been carried to a marked extreme and the list of local anesthesia apparatus would fill a comfortably large volume. Naturally, one's equipment must be adequate; it does not have to be of a certain definite manufacture in order to be adequate and effective. Two or three good Luer syringes of five and ten c.c. capacity, preferably with the eccentric tip, a number of close-fitting needles of varying length and gauge, together with a generous supply of the anesthetic solution constitute a sufficient equipment.

Many of the continental operators are using various solutions—stovain, procain, eucain and even cocain, and in greatly varying strength, and with or without the addition of epinephrin. In America procain has practically superseded all other drugs for this purpose. The consensus of opinion is that a solution of procain, ½ to 1½ per cent, with the addition of a drop of adrenalin solution to the drachm, is about the best; that when loose, cellular tissue is to be incised, it is better to use a stronger solution; that the adrenalin does enhance and prolong the effect of the procain, but that it should generally not be used in thyroidectomy.

METHODS

There are three general systems or methods of employment in local anesthesia with many modifications of each. These are infiltration, nerve block and field block. As the terms imply, infiltration consists of injecting the line of incision, usually in successive layers, beginning with a row of intradermal wheals; field block means the blocking off of the entire field of operation by a complete wall of anesthesia, produced by superficial and then by deep injections, made through the preliminary intradermal wheals, thus completely isolating the area invaded; while nerve block implies injection of the solution into or about the nerve trunks supplying the operative field. Each method has its indications and its adherents, but no one method may be adapted to every surgical condition and often the operator must make use of two or more of the methods in order successfully to cope with the conditions encountered. In general it may be said that simple infiltration is adaptable to the minor procedures, such as the opening of an abscess, the enucleation of superficial neoplasms, and the like; that field block is next in magnitude and may generally be employed in minor amputations and in most simple laparotomies; while nerve block is better suited to the major operations within the abdomen and the pelvis and to the major amputations.

Just why spinal anesthesia should so often be classified by itself and be distinguished from other forms of nerve block by the use of the common term spinal analgesia it is hard to understand. It is simply a major nerve block, including all of the spinal cord below the site of the injection and should be so considered, the term spinal anesthesia denoting the method and region involved rather than any special or distinct type of anesthesia.

As indicated above, infiltration is the simplest form of local anesthesia. It is necessary only for the operator to inject slowly and gently enough of the anesthetic solution to produce a row of wheals within the layers of the skin along the line of the proposed incision. Anesthesia of the skin is complete almost as soon as the injection is finished and lasts from fifteen to thirty minutes or longer, which is ample for such minor procedures as the method warrants. Should there be evidence of returning sensation before the work is completed, more of the solution is injected as required. If the work has to be carried into the deeper parts beneath the skin, the succeeding layers are injected as they are encountered and, analgesia being immediate, there is slight if any delay in the operation. Thus the infiltration method may be used in a laparotomy, for instance, each layer being injected before it is opened. This does slow up the operation somewhat and is, therefore, not generally satisfactory.

For performing field block the operator begins by making four to six intradermal wheals at appropriate intervals about the area to be invaded. The fine needle used for this purpose is then detached from the syringe and a long needle applied; this should be not less than three inches in length and of 22 to 19 gauge. The large needle is then entered through the center of one of the wheals previously raised, and at right angles to the skin. As the needle is advanced, the solution is slowly expelled into the tissues. In a laparotomy this is continued until the fascia of the different layers is encountered and injected. Experience rapidly determines the depth to which these must be carried and each layer produces a definite resistance to the passage of the needle, so that one soon becomes able to distinguish them. The needle is then withdrawn into the loose cellular tissue just beneath the skin, but is not entirely removed; it is then advanced, as before, but at such an angle with the line of the first course of the needle as to gradually approach the area to be reached through the next wheal. This procedure is repeated through this and all the other wheals previously prepared, until the entire area outlined has been injected with the solution to the depth to which the incision is to carried and a complete wall of silence has been erected about the field. Anesthesia by this means becomes complete in five to ten minutes, when free incision may be made. In a laparotomy it is often necessary to infiltrate the peritoneum separately when it is exposed.

The viscera generally have no tactile or pain sensation and may be handled or cut with impunity. One must bear in mind, however, that the slightest pull on the mesentery causes a prompt response of pain. It becomes necessary, therefore, either to avoid all traction upon that structure or to employ further infiltration of the portion involved. In appendectomy this is readily done; in many other intraabdominal procedures it may be difficult or impossible of accomplishment and it may be necessary to inject the splanchnics direct, after the manner of Farr and others.

Labat aptly calls nerve block "physiologic section of a nerve." It results in the complete anesthesia of the territory supplied by that nerve, distal to the point of injection. It is better to inject the solution about the nerve rather than directly into the nerve trunk. The latter method produces shock when the larger nerves are involved and it does not give any better degree of analgesia nor one of more than a few seconds quicker induction. When a rather large nerve trunk is encountered by the needle, there is always a distinct paresthesia produced and this should be looked for and counted upon as definite evidence of the proper placing of the needle, a point repeatedly emphasized by Kulenkampff and others. Naturally, nerve blocking requires definite anatomic knowledge which may and must be acquired by close study, and its adaptation to regional anesthesia is definite and very gratifying.

Our dental brethren have so perfected the technic of the nerve block in their particular field that it is the commonly accepted practice, especially in extensive or difficult extractions. It behooves us to acquire the methods they use for application in our oral surgery, particularly in cases of fracture of the jaw and of plastic work about the mouth. The technic is simply to inject 2 to 5 c.c. of the solution into, or better, in close proximity to the nerve supplying the part to be incised. Anesthesia is immediate and complete and of sufficient duration for any ordinary surgical operation. The classic brachial plexus block, by means of which any operation upon the arm below the shoulder may be performed, is a brilliant illustration of this method.

Spinal anesthesia is but an adaptation of nerve block to the largest nerve of the body and its induction does not differ materially from that employed for other large nerve trunks. It is probably the best technic to prepare the anesthetic solution by dissolving a definite amount, usually 10 c.g. of novocain, contained in a sterile ampoule, in 2 c.c. of the spinal fluid. This is then reinjected into the spinal canal at the proper level. Extensive experience with other drugs, such as stovain, eucain, etc., especially abroad, has taught that novocain is the best and safest drug for the purpose, as it is in other regions.

Anesthesia should be complete below the level supplied by the nerves reached by the injection in from five to fifteen minutes, a time much shorter than can generally suffice for the induction of general anesthesia. If it is longer than that, the solution has not been properly placed, it is not strong enough for the particular case in hand, the patient has been kept upright too long after the injection or not laid flat enough on the table. It is the general practice to inject a stimulant, should signs of weakness or fainting occur. Personally, I much prefer to inject at once in every case, as soon as the spinal injection is complete, a hypodermic of strychnin, caffein and spartein, as recommended by Labat. It wards off trouble and does no possible harm, while adding materially to the comfort and confidence of the operator.

FIELD BLOCK FOR SEQUESTRECTOMY

R. M., a young man of 19, was kicked on the left shin by a mule, three months ago. Osteomyelitis developed and he was in the hospital for several weeks, being eventually discharged with occasional escape of seropurulent material from a sinus over the upper fourth of the tibia. March 13, 1925, he reentered the hospital in our service, was put to bed and the usual hypodermic narcotic administered. After preparation of the leg, 10 c.c. of 2 per cent procain solution, with three drops of adrenalin 1-1000, were injected, forming a block completely around the area to be invaded, down to and including the periosteum, the injections being made in clean, sound tissue. Anesthesia was complete in three minutes. The shell of bone was then chiseled away and the sequestrum, 1½x¾ inch removed. The walls of the cavity were sloped gradually to the bottom, iodoform gauze packed in firmly and the resulting wound left to close by granulation. No sutures were used. There was no pain at any time, and the final result was entirely successful.

FIELD BLOCK FOR APPENDECTOMY

W. P., male, age 18, entered the hospital January 4, 1927, for operation for acute appendicitis. After the usual preparation, including preliminary hypodermic narcosis, he was taken to the surgery and the field prepared in our customary manner. Six intradermal wheals, surrounding the field at McBurney's point, were raised, using a half-inch, 26 gauge needle. The fine needle was then replaced by the three inch, 20 gauge needle and deep injections made, as previously described, down to the peritoneum, forming a wall of silence entirely about the operative area. When the peritoneum was exposed, it was infiltrated along the extent of the incision. A gangrenous appendix was exposed by gently pushing aside the cecum. After infiltrating the mesoappendix with a few drops of the anesthetic solution, it and the appendix were ligated firmly, the appendix cut away and the stump invaginated. There was some pain during the raising of the cecum, due, of course, to the traction upon the imperfectly anesthetized mesentery.

FIELD BLOCK FOR THYROIDECTOMY

M. L., age 24, presented the usual symptoms of a beginning toxic goiter, properly verified. She entered St. Ignatius Hospital on May 22, 1927, rested during two days and went to the surgery after having received the customary hypodermic of morphin gr. ¼ and scopolamin gr. 1/100. The thyroid region was surrounded by intradermal wheals, through which liberal quantities of 1 per cent procain were injected, as the needle was advanced, until the entire field was blocked off. A few deep injections were made above and behind the superior poles of the thyroid bilaterally, this being a particularly sensitive area. We do not infiltrate the line of the skin incision in this operation, since the anesthesia in the entire field is complete and promptly attained. Approximately three-fifths of both lobes and the entire isthmus were enucleated. The patient had no sensation of pain at any time.

Infiltration, field block or nerve block may be used in thyroidectomy and the different methods are being used successfully by different operators today. The method described, however, is the one we have found best adapted to our work and our qualifications.

NERVE BLOCK FOR AMPUTATION OF LEG

J. W., age 32, employed by a highway construction contractor, stepped into the hopper of a rock-crusher and suffered a complete crushing of his right foot. He was brought to the hospital June 8, 1926, in the profound shock to be expected. Excessive loss of blood had been prevented by the application of an excellent tourniquet by his fellow workmen. He was taken to the surgery, prepared and then turned on his left side. Through an intradermal wheal one and three-quarters inches above the bend of the knee posteriorly, a 2½ inch needle was inserted perpendicularly to the skin in the outer third of the diameter of the thigh at this point. As the needle was advanced, impingement upon the trunk of the sciatic nerve was evidenced by the patient in the way of paresthesia, referred to the toes. This gave definite information that the nerve had been reached. The needle was withdrawn an eighth of an inch and 5 c.c. of 2 per cent novocain solution injected slowly. The "garter infiltration" recommended by Labat was also established by infiltrating a ring completely about the leg just below the knee. Anesthesia was complete in twelve minutes, when amputation two inches above the ankle was performed. The patient maintained that he felt no pain at any time during the operation.

SPINAL BLOCK FOR UTERINE SUSPENSION

Mrs. J. W., age 69, entered the hospital for correction of prolapsus uteri of many years standing. She was very nervous and accepted rather grudgingly our assurances that the proposed spinal anesthesia would render the operation painless. Following spinal puncture, 8 c.c. of the spinal fluid were withdrawn into a sterile graduate; then 2 c.c. more were allowed to drip into the opened end of the ampoule containing 10 c.g. of procain crystals. The ampoule was agitated, to hasten the solution of the crystals, while further escape of the spinal fluid was prevented by a thumb over the projecting end of the needle. When the solution was complete, it was drawn up into a 5 c.c. Luer syringe through another coarse needle, which was then detached and the syringe connected to the needle in the spinal canal. Two c.c. of the solution were slowly injected, the plunger slowly withdrawn until it showed 5 c.c. again; then 4 c.c. were injected, a further small quantity withdrawn into the syringe; and this procedure repeated until the entire solution had been thrown into the spinal canal. The patient was immediately laid flat and the "corrective solution" of strychnin, caffein and spartein given hypodermically. Anesthesia was not complete until after eighteen minutes had elapsed. The Coffey round ligament plication operation was performed, the patient suffering no pain.

In dismissing with brief mention the subject of paravertebral block we are, we believe, expressing the opinion of the great majority of surgeons who believe that the method, while very often successful, is very difficult, uncertain, the technic complicated and not free from danger, and the results variable; so that it has largely been abandoned in favor of the other quicker, surer, safer methods of regional anesthesia.

PRESENT STATUS OF LOCAL ANESTHESIA

Even a cursory reading of the literature shows the rapid strides that have been made in the use of local anesthesia in late years and the very general adoption of the method. The enthusiasts have become more moderate in their assertions, while the ultraconservatives have come to admit its great possibilities, until today there has become established a true rationale of the procedure, the outgrowth of a wide and varied experience of operators everywhere. There is generally an increase in the accepted indications, chiefly due to improved and simplified technic. Local anesthesia is an approved method in surgery and is becoming as nearly standardized as the personal equation of different operators could permit any procedure to become. The accepted means of induction are three: Infiltration, field block and nerve block, the second having the widest field of application and the most general acceptance. The use of a light general anesthesia is often necessary, this sometimes being due to a faulty estimate of the surgical situation previous to operation.

Splanchnic anesthesia is often difficult to obtain. It may be secured by the paravertebral method, with its difficulties and frequent failures; or by the direct, visual method, advocated by Farr and others and which is almost always successful. The paravertebral method is by far the most difficult and is being used less and less. Spinal block, on the other hand, is gaining in popularity and its field is being rapidly extended, some operators using it almost to the exclusion of all other methods. The use of accurately measured amounts of procain, dissolved in the spinal fluid, has removed much of the difficulty and the danger formerly attendant upon this type of nerve block.

SUMMARY

1. Local anesthesia is now a fully accredited and accepted method.

2. There is no rivalry between local and general anesthesia and they are to be used cooperatively.

3. The technic of local anesthesia is radically different from that of general anesthesia but it is not too difficult to be acquired by the general surgeon.

4. Exact anatomic knowledge, gentleness, speed, accuracy, sharp dissection, justified self-confidence, together with a simplified technic and equipment, assure success by this method.

5. Postoperative complications are less and recovery is more rapid than with general anesthesia.

6. Local anesthesia renders more cases operable and thus extends the field of surgery.

7. Surgical wounds heal more promptly, due to the necessarily lessened trauma.

8. Spinal anesthesia is now considered as an extensive nerve block and is no longer a questionable method.

9. Spinal block is generally adaptable to surgery below the diaphragm.

10. Paravertebral block is still in the experimental stage and has not yet gained general adoption, although progress is being made.

11. The best and safest solution for general use is ½ to 2 per cent procain, with the addition of a small amount of adrenalin, 1-1000, except in goiter or in cases with high blood pressure.

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ACUTE GLOMERULONEPHRITIS

A REVIEW OF THE MECHANISM INVOLVED IN THE PRODUCTION OF ACUTE GLOMERULONEPHRITIS AND ITS RELATIONSHIP TO THE DEVELOPMENT AND PROGRESSION OF THE CHRONIC NEPHRITIDES *

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In the normal microscopic anatomy of the kidney one has to consider the glomerulus and the tubule. A conception of the relationship between vascular and tubular structures is of aid in the interpretation of associated vascular and tubular disease.

O. Paul Saxyl of Vienna holds the view that the glomerulus is composed of a tuft of capillaries which has an approaching or afferent vessel, and a departing or efferent vessel. From the efferent vessel branches are given off which are wrapped around the proximal and distal convoluted tubule as it emerges from Bowman's capsule (fig. 1).

This joint distribution of the same capillary between the glomerulus and the tubule demonstrates the dependence of the tubule upon the circulation passing through the glomerulus. Disturbed conditions within the glomerulus will cause a diminution in the caliber of the capillary lumen, with consequent reduction in the volume of blood passing through the vessels in any given period of time. An inflammatory process within the capillaries will cause an infiltration of the intimal lining bringing about this condition, or according to Volhard[1] a toxic agent causes a spasm of the vas afferans, which produces an ischemia in the circulation beyond the efferent vessel.

If the tubule is dependent for its blood supply upon what can pass through the glomerulus, then it is easy to appreciate how degeneration of the tubular epithelium may result from arterial involvement.

Rowntree, Fitz and Geraghty[2] reviewed the literature in 1913, and concluded that three facts had been established, namely, that following the complete or partial obstruction of the venous circulation in the kidney there results (a) albuminuria, (b) hematuria (if the lumen of the vein be greatly narrowed), (c) the appearance of epithelial cells, singly, in groups, or as casts in the urine.

On the basis of this work Ivy[3], in 1926, occluded the blood vessels of the kidney, and produced an ischemia lasting from thirty to sixty minutes. This ischemia over this period caused degenerative changes which were evidenced in urinary findings as albumin and cells. The cells were composed of kidney cells, and red and white blood cells. The albumin persisted after this injury from one to four months. Frequently these dogs developed what is known pathologically as the "small white kidney."

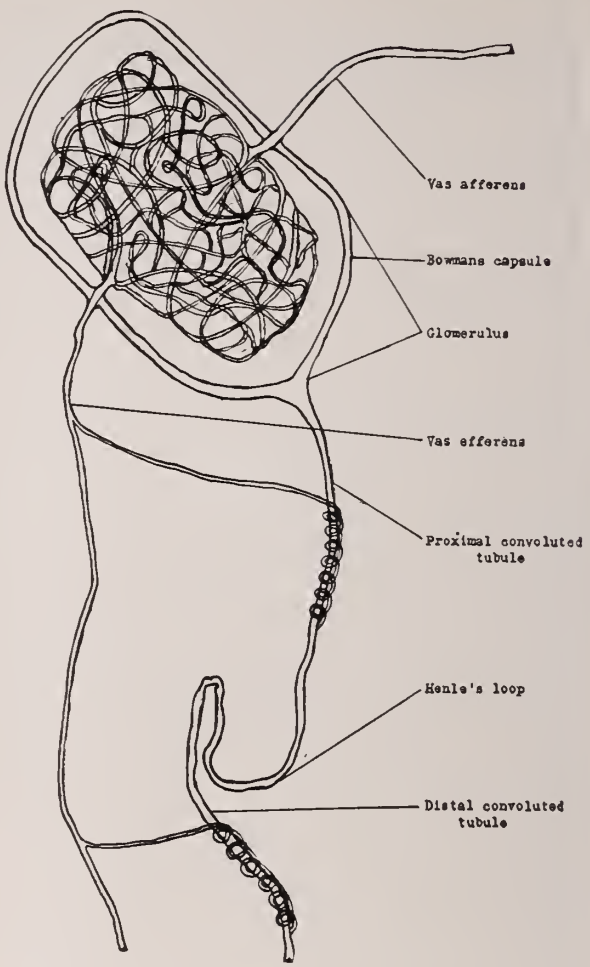

Fig. 1. Diagram of glomerulus to show blood supply of convoluted tubules.

It may be taken as established, then, that chronic passive congestion of the kidney, or lack of an adequate amount of blood passing through it produces albumin and cells within the urine. How is it possible to link these facts with acute and chronic kidney disease?

A brief consideration of the factors influencing the glomerulus, and as a result the quantity of blood passing through it, will aid us in focusing our attention upon etiologic factors with reference to kidney disease. We will enumerate these etiologic factors as (a) acute infection, (b) chronic infection, (c) arteriosclerosis, (d) disturbances in metabolism.

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* Read before King County Medical Society, Seattle, Wash., May 14, 1928.

ACUTE INFECTION

In association with the acute infections the best example for the study of nephritis comes in scarlet fever. Accepting the streptococcus as the etiologic factor, we have the following manifestations of the infectious process:

1. An incubation period of from two to four days.
2. A sudden onset of symptoms, composed of (a) sore throat, (b) vomiting, (c) rapid rise of temperature, (d) rapid pulse, (e) dry skin, flushed face, and furred tongue.
3. Skin eruption twenty-four to thirty-six hours after onset.
4. Subsidence and stage of desquamation.

During this entire process the same toxin affecting the skin, the vomiting and temperature centers is affecting the kidney and exerting its influence upon its capillaries. If we focus our attention briefly upon the product of kidney activity, namely the urine, what may be found there which portrays the activity of this offending streptococcus infection? Coincident with the initial temperature rise there may be an initial albuminuria which may promptly disappear. However, in 5 per cent of the cases varying symptoms of severe kidney involvement are presented. These may be simple albumin, great quantities of albumin or much blood and many casts.

What has transpired within the kidney during the incubation and development of this streptococcus infection resulting in a scarlet fever? It is assumed by Volhard that acute infection first progresses sufficiently to produce a toxin. This is absorbed and comes in contact with the capillaries throughout the body. The contact of the toxin with the capillaries produces a constriction of them and a consequent elevation in blood pressure. This elevation may or may not be permanent, but it is followed closely by a generalized capillaritis.

The influence upon the kidney capillaries up to this stage is no different than that upon the general capillary system, but the secondary influence upon the kidney tubule structure which soon manifests itself is a sequella of the ischemia produced by the constriction of the capillaries. The severity of the damage is governed by the length of the ischemia. The time element may be gauged from Ivy's work, where he demonstrated that thirty to sixty minutes was ample to cause a severe nephritis.

The toxin which causes the first capillary surge and constriction does not cease to exert its influence with this phenomenon. There soon results a generalized capillaritis. This means an infiltration of the capillaries, and part of the general picture is an infiltration of the vas afferens, the glomerulus and the vas efferens of the kidney. The endothelium of the greater vessels of the kidney may also become infiltrated. The vessels going to the tubules from the vas efferens are affected, and so are the tubules because the blood supply is poor.

The appearance of the blood in the urine is the gross objective symptom of the severe kidney damage caused by the transfer of toxin from the infection. The manifestation upon the kidney of the effect of this toxin originating from an infectious process, then, is (1) irritation of the circulatory system evidenced by increase in blood pressure either transient or permanent, (2) a generalized capillaritis, (3) inflammation within the kidney with extensive destruction of kidney substances. Objective findings are albuminuria, casts, edema and blood.

The following case history will serve to present the subjective symptomatology associated with septic sore throat, resulting in acute glomerulonephritis. About one month ago the patient had a sore throat and fever. This tonsillar infection was followed by a tonsillar abscess which was incised and drained. With the formation of an abscess the necessity of taking care of a greater amount of toxin is thrown upon the circulatory system. Eight days after the tonsil was incised the urine became quite red. Edema then appeared. The temperature subsided in a few days and the urine improved.

It is conceivable that these manifestations, so far as the kidney is concerned, may only progress as far as the initial capillary surge or to the stage of development of the capillaritis, or they may continue on to the place where the kidney as a whole is infiltrated, and the gross pathologic picture of acute nephritis presents itself. An acute nephritis may endure only for one day and then slowly go away, or in other instances it may continue for months. It may endure for two years and heal after this time. It is important to consider more than time in our conception of acute and chronic kidney disease.

The different forms of arterial response to acute and chronic infection, namely, early contraction, irritation and infiltration with narrowed lumen, arteriosclerosis and final destruction, follow one upon the other. The stages are intermingled, or they may progress so rapidly that some are omitted, and destruction may occur very quickly.

The general systemic reaction is more prominent in the instance of scarlet fever than it is with acute, simple sore throat, but the end result of the development of an acute nephritis as the result of kidney damage is the same in both instances.

Twenty-five per cent of all cases of acute nephritis are preceded by a sore throat.

How does acute nephritis end? It may heal completely, or blood may remain in the urine for some period of time. An acute nephritis may go over into an orthostatic albuminuria. If acute nephritis does not heal, it goes over into a chronic nephritis.

Treatment. The therapy in acute nephritis is important, as it may becide the fate of the patient.

First period (three to five days). Confine to bed and maintain a hunger and thirst program.

Second period (one week). After first period start fluids, but not in great quantity (700-800 c.c.). Also start carbohydrate foods, sugar, fruit juice, rice, and then cream soups without salt. Continue for one week.

Third period (four days). Add vegetables, then butter and oils.

Fourth period (third to fourth week). Add 40 grams of protein in the form of milk and eggs.

Fifth period (fourth week on). Add white meat, working protein up to 60-80 grams in an adult. Continue this program for months. Have singular drink days one or two times a week, during which time the patient may take as much water as he likes.

There is no indication for much medicine. If urine is scanty, digitalis and potassium acetate (15 gr. doses) may be used for diuresis. The purin substances are not used in acute glomerulonephritis. Novasural is not used. Hematuria is a contraindication to thyroid extract administration. Decapsulation may be used with long enduring hematuria, or very scanty urine and severe intoxication, but not with uremia.

Great care should be exercised in deciding to remove the tonsils in the presence of an acute process within the kidney. A more severe state develops in the kidney following tonsillectomy. This should be borne in mind in acute focal nephritis as well. The tonsils should be removed in the quiescent period. The removal of the tonsils only prevents the effect of *this* lymphatic tissue upon the disease. There are lymphatics around the tonsils where the true infection is harbored.

CHRONIC INFECTION

The influence of the mechanism described in acute glomerulonephritis on the development of a chronic nephritis can readily be appreciated. An acute infection may reach its peak in one day and then subside, or the bodily resistance against the invading organism may be so low that it is present over months or years, and each day contributes its quota of toxin to the blood stream which has its direct influence upon the capillaries, causing permanent and fixed changes within their walls.

The result of this continued attack upon the kidney vessels is apparent in the secondary contracted kidney so familiar at the pathologic demonstration. This is termed secondarily contracted, because it is secondary to repeated attacks of inflammation caused by chronic infection. The kidney under the influence of chronic infection is more susceptible to acute nephritis, when bodily reactions due to severe acute infections are current. In 50 per cent of all cases of acute nephritis there exists a chronic infection in the nose or adjacent cavities.

ARTERIOSCLEROSIS

When arteries become sclerosed the lumen becomes narrowed, and the elasticity is lost. These changes diminish their efficiency as conveying structures, and tend to produce an ischemia in the organs which these arteries supply with blood. The sudden influence of this ischemic factor upon the kidney has been considered in acute infections, and the slower constant repetition of the same factor has been spoken of in consideration of chronic infections. Now we have for consideration a kidney in which the blood supply is constantly and permanently diminished because permanent changes have occurred within its blood vessels. This is the kidney of chronic interstitial nephritis, the primarily contracted or arteriosclerotic kidney.

It is interesting to consider the etiologic factors of arteriosclerosis, and see how prominently these coincide with our conception of irritating factors first operating upon the capillaries in acute kidney disease. The etiologic factors for arteriosclerosis as usually listed are (1) high blood pressure, (2) senile involution changes, (3) secondary contracted kidney (the kidney resulting from repeated insults from chronic infection), (4) chronic intoxications (lead, tobacco, gout or a disturbance of metabolism), (5) syphilis.

The factors listed here are constantly causing capillary irritation and this irritation causes arteriosclerosis. These changes in turn diminish the blood flow to the tubules with resulting ischemia, and consequent tubule involvement and destruction.

In view of what is to be said later, may this opportunity be used to lay emphasis upon the fact

Number	979				671		78	
Date	5/2/28	5/3/28	5/4/28	5/5/28	6/17/23	12/15	5/27/25	3/3/26
Appearance	Clear	Clear	Cloudy	Cloudy	Clear	Clear	Clear	Clear
Color	Straw	Straw	Straw	Straw	Straw	Straw	Straw	Straw
Reaction	Acid	Acid	Acid	Acid	Acid	Acid	Acid	Acid
Sp. Gravity	1.030	1.015	1.025	1.024	1.037	1.025	1.020	1.020
Albumin	Trace	Neg.	Neg.	Neg.	3 +	—	4 +	Ft. Tr.
Sugar	Pos.	Pos.	Pos.	Pos.	4 +	—	1 +	—
Sugar %	2.5	1.3	2.5	1.6	3 +			
Urea		22	24	34				
Acetone	4 +	4 +	2 +	2 +	4 +	—	1 +	
Diacetic					4 +	—	1 +	
Epith. Cells	Few	Few	Few	Few			Few	
Pus	Few	Few	Few	Few			Few	
Gran. Casts							Many	—
Hyal. Casts								

Fig. 3

that under the heading of chronic intoxication, gout or a disturbance of metabolism is listed as an etiologic factor in causing arterial irritation.

DISTURBED METABOLISM

The purpose of this paper is:

1. To demonstrate so far as acute infections are concerned the mechanism operating to cause acute kidney disease, and to associate this with the development of chronic kidney disease through the constant application of the same factors in a chronic infection.

2. To call attention to the importance of ischemia within the kidney in conjunction with arteriosclerosis, and to associate the etiologic factors of arteriosclerosis, namely, chronic infections and disturbed metabolism, with the etiologic factors of acute nephritis.

3. To demonstrate clinical observation of disturbed metabolism operating to cause kidney irritation, and the removal of this irritation by means of correcting this metabolic abnormality.

It is apparent that factors other than infections and arteriosclerosis may cause kidney irritation. MacNider[4] has demonstrated that the injection into the blood stream of concentrated acid or alkali will cause glomerular and tubular changes which are identical with those taking place in acute and chronic bacterial infections. Anything affecting the capillary tuft of the glomerulus and interfering with the blood supply to the tubule injures the tubule and causes signs of degeneration, namely albumin and casts. Can we, then, in pathologic physiology find conditions which will cause kidney irritation of a mild degree? Is it possible to influence this altered physiology in such a way that the kidney may be protected from harmful influences?

ACIDOSIS

With MacNider's work as a suggestion, let us consider first acidosis. The most glaring form of acidosis occurs in the diabetic, and is associated with acetonuria and diminution of the carbon-dioxide combining power of the blood. Joslin[5] has shown how kidney irritation will present itself with acidosis and pending coma.

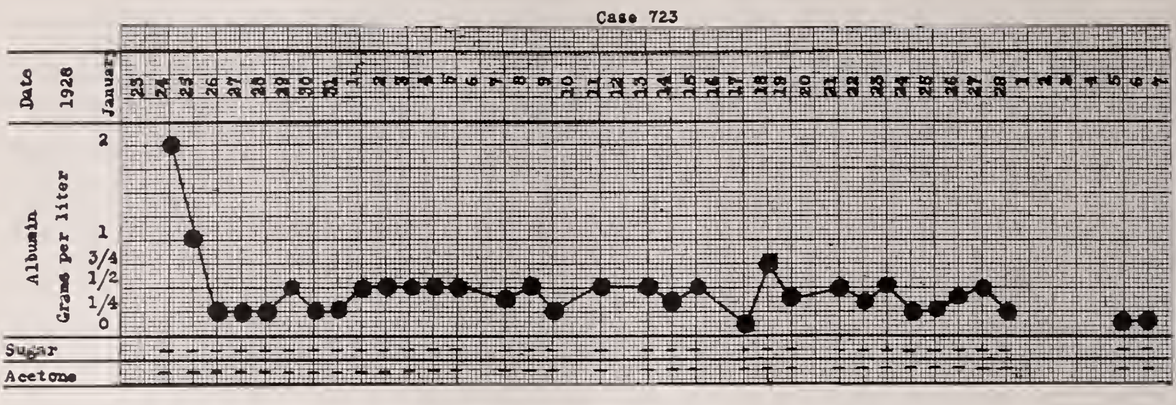
Permit me to draw from this condition of grossly disturbed body chemistry several illustrations which will serve to show how the elimination of the basic factor of abnormal metabolism of carbohydrate, protein and fat will eliminate the kidney irritation. The evidence of elimination of irritation is the disappearance of albumin.

Case 979. L. U., boy 15 years old. Diagnosis diabetes mellitus. Had diabetes and was treated with excellent result for six months. Urine showed no albumin. Parents decided on christian science treatment for three weeks with resultant severe acidosis.

This case represents severe acidosis with kidney irritation, and disappearance of the irritation with diminution of the acetone bodies. Apparently the percentage of sugar excreted is not the determining factor here, for with the rise in the sugar output on the third day there is no reappearance of the albumin.

Case 671. J. P., male 66. Complaint diabetes. Careful management from a dietetic standpoint removed the sugar and acidosis, and slowly following them, the albumin and casts disappeared.

Case 78. C. B., male. Diagnosis diabetes mellitus. This man represents not so much disturbance from the standpoint of acidosis, but marked disturbance in the ability to metabolize glucose. From this one would assume that the disturbance in the acid base



Number	829				803		900	
Date	1/21/28	2/3/28	3/20/28	5/11/28	3/20/28	4/17/28	5/7/26	7/20/26
Appearance	Clear	Clear	Clear	Clear	Clear	Cloudy	Clear	Cloudy
Color	Amber	Amber	Amber	Amber	Straw	Straw	Amber	Straw
Reaction	Ac. 35	Ac. 70	Ac. 60	Ac. 44	Ac. 35	Ac. 70	Ac. 20	Ac. 15
Sp. Gravity	1.030	1.030	1.020	1.030	1.028	1.020	1.020	1.022
Albumin	1 +	—	1 +	—	1 +	—	4 +	—
Sugar	—	—	—	—	—	—	—	—
Sugar %								
Urea								
Acetone	—	—	—	—	—	—	—	—
Epith. Cells					Many	Many	Few	
Pus					Few	Few	Few	—
Gran. Casts					—	—	—	—
Hyal. Casts					—	—	Few	—
Indican	1 +	—	1 +	—	3 +	—	—	—

Fig. 4

equilibrium, while it has its tremendous influence, is not the only determining factor.

As evidence of this permit me to cite Case 723 (fig. 2). E. J. B., female, age 70. This patient was fed carbohydrate 100, protein 50 and fat 125. There was marked improvement clinically, associated with the accompanying change in albumin output.

The gross metabolic disturbance such as diabetes with extreme acidosis lends itself to interpretation.

Some mention must be made of kidney irritation not associated with demonstrable gross metabolic disturbance, where similar factors are probably operating but in not so severe a degree.

Case 829. G. H., male, age 34. Complaint indigestion and eye trouble. Dr. Bentley furnishes the eye findings as rather sudden disturbance of vision in the right eye, with retinal edema and considerable subsequent improvement. This individual was fed carbohydrate 198, protein 60 and fat 166. The albumin has disappeared, and the eye symptoms have improved. The degree of acidity of the urine still remains high.

Obesity and chronic constipation has its influence in case 803, L.C.F., female, age 28. Here the albuminuria cleared up as soon as the constipation was relieved.

There are times when the rapidity with which albumin will disappear is startling. Case 900 demonstrates this.

Mr. Y. N., young man. Father had been under my care for chronic nephritis, and died of uremia one month prior to the appearance of the son as a patient. Complaint, pain in stomach and constipation, for which he is taking senna tea. In view of the father's death one month prior, I withheld the findings in this young man's urine, feeling that he would share a similar fate. To my surprise the urine was free in six weeks' time. He was fed a low protein diet with aboundant roughage for the constipation.

SUMMARY

An attempt is made to present the mechanism of capillary irritation acting in acute glomerulonephritis, and to show the result upon the uriniferous tubule. With this mechanism of acute response to infection as a background an effort is made to portray the means of development of chronic kidney disease through the constant application of the same irritating factors.

A transition is made from the infectious to the noninfectious mechanism through the work of Mac-

Nider, and it is assumed that irritating factors not of infectious origin may act through the same mechanism of capillary irritation, and resulting ischemia to the kidney tubule.

Cases are presented to demonstrate how disturbances in metabolism may cause irritation, and how this will disappear when the disturbance in metabolism is corrected.

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THE MANAGEMENT OF ACUTE GONORRHEA IN THE MALE *

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Although gonorrhea is one of the oldest diseases, it is one of the worst treated and one in which there is less of a standard form of treatment than almost any other condition. To illustrate this point permit me to briefly refer to the histories of three cases which I have seen recently.

One was a man who had been treated by a physician in the eastern part of the state, who had instilled into the urethra twice a week a few drops of two per cent silver nitrate solution and had prescribed a zinc solution for home use.

A second man had been treated by a genitourinary specialist in Chicago who injected into the urethra twice a day a two per cent mercurochrome solution, at three dollars an injection. This treatment was continued until one hundred seventy-five dollars had been collected. By this time the patient was not only not cured of his urethritis but had developed a prostatitis.

A third patient was treated in a neighboring city by a specialist who had him come to the office once a day and injected a solution of acriflavine or gave an irrigation of potassium permanganate, with no other treatment. This form of treatment had been continued for two weeks, and when I first saw the patient he still had a profuse discharge teeming with gonococci.

The need for a rational, more or less standardized form of treatment must certainly be clear to all.

First, a word as to the prevalence of gonorrhea. According to a recent survey made by the United States Public Health Service[1] in fourteen communities in West Virginia, Kentucky, Illinois and Arkansas, they found an incidence of 4.96 per 1000 population. They found gonorrhea to be 2.41 more prevalent in the male than in the female. Prevalence increases with the density of the population, being abundant in the cities and comparatively rare in the rural districts. Further interesting points revealed were that twenty-five per cent of the cases were being treated in public clinics. The average number of cases per doctor were 6.37. Ten per cent of osteopaths and chiropractors were treating venereal diseases.

Some of the more recent methods of treatment which have been advocated are as follows: Redwill and Potter[2] advocate the use of mercurochrome 1 per cent in 50 per cent glucose intravenously in 10 to 20 c.c. doses, three times a week, up to twelve to twenty injections, combined with routine therapy.

Williams[3] recommends the use of 1 per cent mercurochrome in 50 per cent glucose in 10 c.c. doses intravenously, plus foreign proteins (milk), for three or four doses every forty-eight hours, combined with quiet and rest. Then protargol ½ per cent t.i.d. He claims for this method that the average time of cure is twelve days.

Pelouse and Schofield[4] describe at length their work with a gonophage, an invisible and as yet unknown agent that is propagated only in the presence of living bacteria, that is capable of causing a lysis of the gonococci. At the present stage of its development this gonophage is too irritating to be of practical value but it gives promise of being of great aid in the treatment of these cases.

Wolbarst[5] advocates the abortive treatment, if the case is seen within the first twenty-four hours of the appearance of the discharge. He uses the Ballenger method of injecting into the urethra 20 m. of a 5 per cent argyrol solution, reargon or neoargon. The meatus is then sealed over the collodion and the solution retained three or four hours. This is repeated in six hours, and again twice daily on the second and third days. In acute cases he advocated the administration of the alkaline salts of potassium or sodium, or a pill containing 1 grain of methylene blue and 4 grains of boric acid four times a day. He deprecates the use of sandalwood oil in the acute stage. He does not use irrigations but injections of reargon or neoargon, two and one-half to five per cent, retained for fifteen minutes.

McDonagh,[6] of London, who has added a chapter to Wolbarst's book, says that gonorrhea since the war has been more serious, due to too severe treatment. No prostate should be examined nor should any instrument be used in the urethra during the time of acute discharge or acute complication. In acute rhinitis no nasal douches are used and if so,

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there is an increase of the sinus trouble and complications. The same thing is true of gonorrhea. Therefore, all that is necessary is for the patient to use a 1-10,000 solution of potassium permanganate by injection. When secondary organisms are present he advises the use of a 1-10,000 solution of mercuryoxycyanide. To increase the general resistance he gives two or three intramuscular injections, at five day intervals, of a .002 gram symetrical urea preparation (Sum 36), put up by British Drug Houses, Ltd., 16 Graham St., City Road, England. The injections are followed by a course of vaccines.

A few years ago Corbus strongly advocated the use of diathermy in the treatment of acute gonorrhea. We tried it out with the different electrodes suggested and, while the results were phenomenal in a few cases, the percentage of complications was to high to warrant the continuance of its use. Two years ago while in Rochester, I asked Dr. von Lackum about his experience with diathermy and his reply was that, if I wanted to try it out, they had about $3,000 worth of apparatus which they would sell very cheap.

While East last year, Dr. Nelson was impressed with Dr. von Lackum's method of treating gonorrhea. He acts on the theory that practically all cases of acute anterior gonorrhea become posterior and that it is just as well to begin treating the posterior urethra early. During the first week he injects argyrol, 5 per cent, into the urethra once a day in the office and has the patient use a protargol, ¼ to ½ per cent, at home. After the first week or ten days he passes a small catheter to the posterior urethra and instills a small amount of 5 per cent argyrol solution. The passage of any instrument, even a small well-lubricated catheter, was so contrary to all that I had ever been taught that I was reluctant to take up the procedure, but on questioning Dr. von Lackum, when he was here last summer, he assured me it was safe and practical and would yield good results. Whether because of improper technic, poor selection of cases or other reasons, we did not obtain the anticipated good results and have abandoned the method except in the more chronic cases.

Boyd[7] recommends the use of Bott's (English) acriflavine. His method is as follows. With the patient lying down, acriflavine, 1 or 2 drams of a 1-1000 solution, is injected into the urethra. Cotton is placed over the meatus and the penis held in the erect position for twenty minutes. After six or seven days irrigations with warm, weak solutions of potassium permanganate are used. After three or four weeks, if shreds are still present in the urine, he uses sounds. He says that acriflavine should not be used more than a week and do not hold it in the urethra or stricture may result.

A little over a year ago Herrold and Culver[8] advocated the use of neutral acriflavine 1-1000 in normal saline solutions, to which 10 per cent gelatine has been added, because in such solution it is less irritating, penetrates better, is more demulcent and protective, and more of it remains in the urethra. Recently we have been using a gelatine solution according to the method advocated by Boyd and, while the number of patients has been limited and sufficient time has not elapsed to enable us to draw definite conclusions, we feel that that method is harmless and has given us better results than were obtained by other methods. For the patient to use at home we have been prescribing argyrol 5 or 10 per cent or ¼ to ½ per cent protargol solution. After a week or two of the use of the acriflavine solution we begin with low irrigations of a warm, weak solution of potassium permanganate, being careful not to use any great pressure.

Since so great reliance has come to be placed on argyrol in the treatment of gonorrhea, it is interesting to note that the Council of Pharmacy and Chemistry[9] has omitted it from the New and Nonofficial Remedies because the claims for its efficiency are exaggerated and because no pharmacopeial title synonymous with mild silver protein was given. It was stated to have a mild antiseptic action but acts largely as a mucilaginous demulcent and protective and as a detergent in dislodging pus.

The use of argyrol in many of the large hospitals, as a preventive for ophthalmia neonatorum has been discontinued and a return made to the use of silver nitrate. Since the beneficial action of argyrol results mainly from its "mucilaginous, demulcent and protective action and as a detergent in dislodging pus," it would seem that the 10 per cent gelatine acriflavine solution would possess these qualities in even greater degree than an aqueous solution of argyrol and in addition would have a greater antiseptic effect and would be more beneficial, since it is absolutely unirritating and has greater penetrating effect.

In conclusion I would sum up the main points in the treatment of acute gonorrhea as follows: Give directions as to general hygiene; build up the general resistance as much as possible; avoidance of sexual excitement; plain, wholesome diet; the avoidance of highly spiced foods or condiments; avoidance of alcoholic or carbonated drinks; avoid unnecessary physical exertion; rest as much as possible; drink all the water and milk possible (coffee and tea in moderation), as this causes a frequent washing out of the urethra and dilutes the urine, making it nonirritating.

The urinary antiseptics given internally have very little effect except in a rather concentrated urine, and it is my opinion that more is to be gained in these cases by having the patient drink copious amounts of fluid than in relying upon urinary antiseptics, though in some cases the administration of the compound methylene blue pill may be advisable.

We aim not to use any solution in the urethra which is in the slightest degree irritating, as evidenced by pain, smarting or burning, and any solution used is injected with the greatest care to prevent trauma by the tip of the syringe or overdistention of the urethra.

For the patient to use at home we prescribe argyrol 5 to 10 per cent or protargol ¼ to ½ per cent, to be injected into the urethra with an Asepto syringe and retained for at least five minutes, t.i.d., and to report at the office once a day, where we use the acriflavine gelatine solution, trying to time the injections so that the urethra is treated about every four hours during the day.

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EPIDEMIC CEREBROSPINAL MENINGITIS

FOUR CASES IN ONE FAMILY.

TEN REPORTED CASES

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Five members of a fraternal organization were taken sick within six days with malignant or fulminating type of meningitis, also the wife and three children of another member of the same organization who later were found to have positive throat culture. They had all attended a regular Saturday night lodge meeting, where there was drilling, wrestling and a good deal of hand shaking, but no food was served, and only one outside guest present, who had repeated negative throat cultures.

Case 1. R. S., a service station employee, 31 years of age, was taken sick six days after the lodge meeting, April 20, 1928. He complained of being tired, had sore throat, headache and a chilly feeling, and thought he was catching influenza. That same night he had a violent frontal headache, some pain in the neck and vomited. He was very restless and for the agonizing pains had to receive opiates. At nine p. m., he was delirious.

I saw him the following day at 7 a. m. He was in deep coma. Temperature 104°, respiration 26, pupils pinpoint and marked retention of urine. Except for slight rigidity of the neck, Babinski's and Kernig's signs were negative. His spinal fluid was of low pressure, very cloudy, with 25,000 cells mostly polymorphonuclear leucocytes and full of meningococci. In spite of successive serum treatments at ten-hour intervals, he never regained consciousness and died three days after the first complaint.

Case 2. April 21, 1928, H. J., farmer, 53 years of age, apparently of good health, returned from a fishing trip and was gardening late in the afternoon. In the evening he had some fever, headache and vomiting. Six hours afterwards was unconscious. His spinal fluid was found of low pressure, very cloudy and loaded with cells. He received serum intraspinally, but died in twenty-three hours after onset of first symptoms.

Case 3.. J. T., 52 years of age, for the last month was losing weight and had occasional headaches, sore throat and muscular pains. He thought he was taking influenza. He was seen on the street at noon Monday, April 23, 1928. Had his lunch as usual, but said he did not relish his food. An hour later he had a chill and complained of severe headache and pain back of his neck. Soon he vomited (projectile type) and at 7 p. m. was in stupor and had 103° fever. All night he was delirious and very restless at times.

In the morning spinal fluid had no pressure at all and was very cloudy. Immediately serum was given intraspinally and repeated at ten-hour intervals, and an intravenous serum was given as a last resort. He recovered consciousness Wednesday afternoon, for three hours but soon went into coma and died on Thursday at 10:30 p.m., eighty-one hours after onset of sickness.

Case 4. April 24, 1928, S. J., 49 years old, farmer, had given an exhibition of wrestling and went home complaining of sore throat and dizziness, with very little fever. Later he felt a little nausea.

A spinal puncture showed clear fluid under increased pressure and cell count 5 polymorphs; no serum was given. In eight hours he was reported unconscious. Spinal fluid at this time was very cloudy, loaded with cells and many diplococci. He was given serum both intravenously and intraspinally, but died five days after complaint of first symptoms.

Case 5. April 24, 1928, Mrs. K., 49 years of age, housewife, was taken sick. Her husband had wrestled with case 4 eight days previously and his throat was positive for meningococcus. At noon she complained of sore throat, nausea, headache and had a chill.

She was very relaxed with no rigidity at all. Kernig and Babinski were negative. Spinal fluid had no pressure but was very cloudy. She received one serum treatment intraspinally and died eighteen hours after first complaint of illness.

Case 6. April 27, 1928, S. A. R., blacksmith, 43 years old, at noon complained of loss of appetite. He returned to the shop, where at 3 p. m. he had a chill and sore throat but no headache. In the evening his throat became more painful, fever 104.5°.

CHARTS OF CASES 7, 8 AND 10

Case Number and Date	Sp. Fluid Drained	Appearance	Pressure	Cell Count	Serum Given		Total Serum
					Intras.	Intrav.	
Case 7							
5/1/28							
10 p.m.	21 cc.	Clear	Sl. Incr.	9	15 cc.		
5/2/28							
8 a.m.	30 cc.	Cloudy	Sl. Incr.	5000	20 cc.		
9 p.m.	20 cc.	Cloudy	Normal	6000	15 cc.		
5/3/28							
4 a.m.	17 cc.	Sl. Cloudy	Normal	900	15 cc.		
5/4/28							
8 a.m.	27 cc.	Sl. Cloudy	Normal	400	23 cc.		88 cc.
Case 8							
5/2/28							
12 a.m.	32 cc.	Cloudy	Incr.	12000	30 cc.		
9 p.m.	25 cc.	Cloudy	Normal	8000	22 cc.	50 cc.	
5/3/28							
10 a.m.	16 cc.	Xanto-chrom	Normal		15 cc.	45 cc.	
11 p.m.	35 cc.	Xanto-chrom	Sl. Incr.		30 cc.	30 cc.	
5/4/28							
9 a.m.	20 cc.	Xanto-chrom	Sl. Incr.	2000	15 cc.		
10 p.m.	22 cc.	Amber	Normal		15 cc.		
5/5/28							
10 a.m.	36 cc.	Amber	Sl. Incr.	1000	30 cc.		
9 p.m.	20 cc.	Cloudy	Normal		15 cc.		
5/6/28							
10 a.m.	37 cc.	Sl. Cloudy	Incr.	600	30 cc.		
10 p.m.	16 cc.	Amber	Low		15 cc.		
5/7/28							
10 a.m.	21 cc.	Amber	Normal		15 cc.		
10 p.m.	27 cc.	Sl. Cloudy	Incr.	500	15 cc.		372 cc.
Case 10							
5/3/28							
10 p.m.	30 cc.	Cloudy	Incr.	6000	20 cc.	40 cc.	
5/4/28							
10 a.m.	20 cc.	Cloudy	Incr.	800	22 cc.		
11 p.m.	18 cc.	Cloudy	Incr.	500	14½ cc.		
5/5/28							
11 a.m.	17 cc.	Sl. Cloudy	Incr.		15 cc.		
5/6/28							
9 a.m.	21 cc.	Clear	Incr.	200	15 cc.		126½ cc.

Of above cases, 8 and 10 showed many meningococci in direct smears of the spinal fluid. They could not be found after the third puncture.

At 10 p. m. he was nauseated and vomited some, had severe occipital pain and numbness of extremities. At 11 p. m. was delirious, and the hands clenched.

That night he had a spinal puncture which showed some pressure and was cloudy. He received nine intraspinal and three intravenous serum treatments at twelve-hour intervals, totaling 525 c.c. He was discharged recovered on the twelfth day.

Case 7. May 1, 1928, B. H., girl 6 years old, was attended for illness. Eight days previous had some dental work done by a dentist who was member of the same fraternal organization and had shown positive throat cultures. She was suddenly taken ill with headache and some nausea (projectile type). Temperature was 104° at onset. She complained of photophobia. Kernig and Babinski were positive; she could not bring her chin to her chest and had backache when leg was raised and flexed. Heart and lungs were normal, respiration 25. Blood count was 19,000 and four hours later 25,000.

Spinal puncture disclosed spinal fluid under normal pressure, clear, and cell count 9, all polymorphonuclears. The spinal fluid was drained and 15 c.c. serum given by gravity. She was relieved of the headache, temperature dropped to 100° and she slept well. Drainage and serum injection was repeated as per chart and in ten days she was discharged recovered with no sequelae.

Case 8. May 1, 1928, B. K., girl 18 years old, daughter of Mrs. K., case No. 5, who had died five days previous, was ill twenty hours and had been treated for influenza. When I saw her she had some opisthotonus, legs were flexed and cramped and the neck was painful and stiff. Kernig and Babinski were positive. She had photophobia, fever 103° and had vomited twice. Spinal fluid was cloudy and golden yellow, with 12,000 cell count and of increased pressure.

On account of marked toxemia, she was given 30 c.c. mixed serum which was repeated in nine hours, with 50 c.c. intravenously after skin sensitization test. Also was given morphine ⅛ gr. with 1/150 gr. atropine. The first 15 c.c. of serum was well diluted with normal salt and given very slowly, and a hypodermic of adrenalin was kept ready in hand. She received 125 c.c. serum through the vein at three sittings together with intraspinal injections of mixed polyvalent serum. Soon symptoms began to clear. In spite of her marked exophthalmic goiter she stood the serum and at the end of the eleventh day was discharged well with no complications except serum sickness.

Case 9. May 2, 1928, B. K. was treated, a boy 21 years of age, son of Mrs. K., case 5, who had died six days previous. He came from the coast to attend his mother's funeral, stayed in the house only twenty minutes for supper and went back to the coast. He was reported sick with spinal meningitis, critically ill, and died thirty-six hours later, with complication of lobar pneumonia.

Case 10. May 2, 1928, girl 8 years of age, daughter of Mrs. K., case 5, was taken sick the same day with her brother and sister. She had fever 104° with headache, photophobia, painful neck, and had just started vomiting.

Kernig and Babinski were negative, except for a few suspicious petechial spots and an inflamed throat. Spinal fluid was cloudy and under pressure and cell count was 1400. Spinal fluid was drained as much as would run and 20 c.c. serum introduced through gravity method, with 40 c.c. intravenously. This was repeated as per chart. She recovered in ten days and was discharged. On the sixth day developed radiculitis with very painful hip joints, which cleared with local heat in two days.

The last two cases had negative throats a day before sickness, but soon gave repeated positive throat cultures during and after illness. One sister and two brothers and the father had positive throats, but were never ill.

TREATMENT

Patients were isolated. Contacts and fifteen people with positive throat cultures were quarantined.

The patients were kept in a quiet room which was darkened, and the public health officer notified. The diet was liberal, when they could eat without urging. They were kept quiet with bromides and hypnotics. The bowels were kept open and the bladder catheterized, when necessary. Proper care was taken to prevent bed sores.

In regard to serum treatment there is a difference of opinion. In our experience the ones responding to the serum showed marked clinical improvement after each treatment.

Herrick[9] maintains that positive blood cultures are observed in forty-five per cent of cases. He treats these with an average of at least 100 c.c. of serum in the vein every six, twelve or twenty-four hours, depending on the severity. The incidence of meningococcemia by other clinicians is 25 per cent.

In early cases serum should be given intravenously, at the rate of 1 c.c. per minute for the first 15 c.c., diluted with normal salt if possible and the remainder can be given more rapidly, in conjunction with 20 and 40 c.c. doses in the lumbar spine. Ventricular puncture was not indicated in our cases.

SUMMARY

Ten cases of epidemic spinal meningitis developed in a rural community, apparently all from the same source, of whom four cases were in the same family.

There were six deaths with four recoveries. None of the cases that went into coma recovered.

All cases that died showed low spinal fluid pressure, as if there was no kick to it. Deaths occurred from eighteen hours to five days after onset.

Diffuse headache, chilliness, sore throat and nausea were the general complaints, with very high blood counts.

Temperature ranged from 99° to 105° at the onset and it fluctuated considerably. There was some pain in the neck and inability to touch the chest with the chin in six cases. Three cases developed characteristic petechial spots. Kernig and Babinski were absent, except in two cases, but all complained of some backache when the leg was lifted and flexed.

On account of the severity and suddenness of onset there was no attempt made to watch the blood pressure fall during drainage of the spinal fluid. All that could be was drained and the patient was given all the serum that would flow in with gravity at eight inches height from the insertion of the needle, so at times more was introduced than drained, with little or no headache.

The older ones generally needed gas anesthesia, as they were very restless. The younger ones stood treatment well under local. They cooperated as uniformly they were relieved of the pounding headache of which they complained.

Cases that were toxic and had signs of septicemia received serum both intraspinally and intravenously.

There was no shock from the treatment, except in one who recovered.

CONCLUSIONS

1. In the early spring, meningitis is more common. One should be on the alert for common colds or sore throats, especially headache and if it is accompanied with high leucocytosis. If spinal fluid is clear and symptoms do not clear, it should be repeated without much delay.

2. Meningitis at the peak of an epidemic may be very malignant, and there may be a very large percentage of carriers with no apparent signs or symptoms.

3. If septicemia is suspected, a cautious but liberal intravenous administration of serum may curb the progress.

4. Incubation period is from four to ten days and it seems epidemic meningococcus meningitis is more infectious than is usually believed.

5. In the last three cases that recovered, standard polyvalent antimeningococcus serum was used of different manufacturers alternately. These made complete recovery without any complications, except temporary deafness of one.

6. The large number of carriers that were discovered indicate that most people have a natural immunity to epidemic meningitis.

7. If the antiserum used does not seem to give prompt results, another polyvalent serum should be tried. The important point is to determine whether the antiserum used is specific for the meningococcus present.

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SUBMUCOUS RESECTION IN CHILDREN *

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Submucous resection is an accepted surgical procedure of great importance in the relief and prevention of a chain of symptoms and conditions. There is a wide variance of opinion as to the age limits for its use, especially as applied to children. There are some differences on the upper age limit but the debatable question is the lower age. There are many good men advocating strict adherence to the lower age limit, while others advise an utter disregard of the age. The operation on adults is of but a comparatively few years standing and on children it may be considered very recent and still unaccepted by many prominent men.

The operation and its indication should be considered from a mechanical, pathologic and physiologic standpoint, both present and future, and unless so done, there will be many failures. Let us look for a moment to the physiology and function of the nose. The basic physiologic functions are: (1) Olfactory, or sense of small, (2) phonation, to resonate the voice and speech, (3) respiratory, to aerate the lungs, (4) gustatory, to assist and modify taste, (5) ventilator, to ventilate the sinuses.

The two main structures of the nose are the septum and inferior turbinate, from a functional standpoint the inferior turbinate playing the major physiologic role. It is the main warmer, humidifier and filter of inspired air.

The swell bodies or erectile tissue of the nose and the serum secreting glands of the mucous membrane so warm, moisten and filter the air that, when it reaches the air vesicles where this function is much less, the lungs and tissues are not traumatized or damaged. But with a deflected septum and blocked nasal condition, the lungs are not so protected and consequently undergo a physiopathologic change, thus markedly altering the development and vitality of growing youngsters.

It is estimated that in a normal functioning nose one pint of serum is transferred from the nasal cavities to the lower respiratory tract in each twenty-four hours. In an obstructed nose this is greatly decreased, thus upsetting the physiology of the lungs, and we also have compensatory atrophy and compensatory hypertrophy in areas of the nasal mucous membrane.

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The vast majority of these nasal obstructions being in children and young adults, why should not the majority of submucous resections be in them? When treatment fails and surgery is indicated, this should be accomplished with greatest respect to the location of the swell bodies and important physiologic areas.

The classification of septal deflections may be thus considered:

a. Cartilaginous deviations of the anterior end of the septum, angular or perpendicular, which may obstruct respiration, block drainage, alter the physiology and greatly affect the accessory nasal sinuses.

b. Osseous deviation, under which we may have:

1. A ridge, crest, knee, spur, knob or one reaching the entire septal length above the cresta nasalis on the vomer, encroaching on the inferior turbinate, thus causing irritation and altered physiology of this important organ, plus a lateral deviation of the septum to the opposite side, obstructing the upper quadrant of the nose.

2. The perpendicular plate of the ethmoid bone impinges on the middle turbinates and they in turn on the lateral walls of the nose, thus greatly altering the physiology and function of the nose, plus blocking of ventilation and drainage of the frontals, antra, sphenoids and ethmoids. The function of this part of the nose practically ceases and is followed by a catarrhal and suppurative inflammation of the nose and accessory sinuses. Here the sinuses are changed to a negative pressure, function and circulation changed, and with the presence of pus organisms as staphylococci, streptococci and pneumococci, we have a suppurative sinusitis or pansinusitis. This may be considered one of the worst and most dangerous types of septal deflections.

3. Barrel-shaped septa. This type may be well considered closely compared to number two, depending on its degree. A great many of these septa are perfectly straight and free of deflections but extremely thick, causing all the conditions mentioned above and are just as urgently in need of surgical intervention.

4. Combined deflections, that is, a succession of waves or deflections in various areas of the septum.

5. Spurs of osseous septum.

The complications and sequelæ of septal deflections and obstructed noses are acute rhinitis and repeated coryzas, acute sinusitis catarrhal and suppurative, chronic hypertrophic rhinitis, chronic hyperplastic rhinitis, chronic turgescent rhinitis, chronic polypoid degeneration of the nose and sinuses, atrophic rhinitis and ozena, chronic sinusitis catarrhal and suppurative, otitis media catarrhal and suppurative, catarrhal deafness, mental apathy and mouth breathing, maldevelopment of the facies and so-called nervousness, thin, undernourished patients with low vitality and poor resistance, thus making them easy prey to other diseases with markedly increased ill-effects of the diseases, asthma and hay fever, snoring and choking while asleep, asthenopia of ciliary and extraocular muscles, browache or headache over frontal region or to the occiput (by pressure on the sensory part of the trigeminus), lack of focusing power of the ciliary muscle and premature presbyopia, dizziness and vertigo. The indications for a submucous resection may be stated as being the prevention of the above-named complications of a blocked nose.

The cause of septal deflections is still a much mooted question. In the developmental sense, Talbot's explantion seems the most accepted. He believes that malformations of the nasal septa are due to neuroses or stigmata of degeneracy and come under the same neurotic influence as pigeon chest and adenoids, and that these cause either an arrest or an overdevelopment of the bones of the face, including deformed septa.

Exciting or extranasal causes may be given as trauma, age, sex, climate, exposure, clothing, constitutional diseases which lower the resistance and upset the metabolism, especially affecting tissues of the respiratory tract and predisposing them to inflammations.

The intranasal causes may be listed as the valve or bellows type of nose which causes uneven pressure within the cavity; large obstructing inferior turbinates which block the lower part of the nose, causing uneven pressure and abnormal development in upper nose; abnormally large and obstructing middle turbinates unilateral or bilateral, exciting uneven pressure within the upper quadrant; large prominent bulla ethmoidalis, occluding the infundibulum and blocking ventilation and drainage.

The symptoms of obstructive septal deviations may be briefly stated as a sense of stuffiness and fullness of nose and pressure over the bridge, dizziness and vertigo, exaggerated on changing the body positions and jarring body, frontal headache prevalent on arising, change in character and quantity of nasal secretions, reflex asthma and hay fever, intermittent nasal stenosis, postnasal dropping into epipharynx, intermittent stenosis alternating from side to side, hemorrhage or epistaxis.

The only contraindication to a submucous resection in children thus far presented is a possible chronologic change in the physique of the nose. With the extreme rarity of this development and with plastic surgery at its height of perfection, how much better off a patient is with a depression on the dorsum of the nose than to have one or more of the above-named complications which might handicap him the remainder of his life.

Since the vast majority of septal deflections and obstructions are in children and young adults and complications or ill-effects are rare, why should we not recognize the physiopathologic law, namely, when the drainage and ventilation of a mucous membrane-lined cavity is impaired or blocked, the conditions are favorable for the growth of pathogenic bacteria; and do more submucous resections in children, thus relieving them of these serious handicaps.

When do we give a fruit tree the best care for its future value? The first few years of its existence. When do we give a pig or calf its best care for a future animal, namely its early days. Then why should we not relieve a child in his early years of all the handicaps possible, thus giving him his best chance in life?

Would a surgeon hesitate or fail to drain circumscribed pus on account of age? With manifest pus in a mastoid do we hesitate on account of age? The answer is no. Then why should a child be compelled to struggle for ten years or longer with a definite physical handicap because it is only five to ten years of age.

Killian, as early as 1908, stated that for a number of years he was opposed to the submucous resection in children under twelve years of age and invariably advised postponement of operation for a few years, but now he recommends to operate early. Loeb did not advise operation before the seventh or eighth year. Hayton, in 1916, published the results of submucous resections in children at the Royal Infirmary, Edinburgh, numbering seventy-three cases performed by Drs. Logan, Turner and Fraser. A quotation from this article states, "The advisability of performing a submucous resection upon a nasal septum before the age of puberty, while not contested as keenly as a few years ago, is still a debatable question."

Orendorff states that he has not operated upon patients under ten years of age. Carter feels that one of the most important factors, if not the most important, to be considered when a submucous resection of the nasal septum is to be performed or not, is the age of the patient. His experience is that extensive destruction of the nasal septum, as in a complete resection in children, eventually results in deformity of the nose, such as broadening of its base, flattening of the bridge or dipping from above downward especially at the ends of the nasal bones, but he recognizes the ill-effects of nasal obstruction and advises relieving the obstruction and with as little trauma as possible.

Alexander expresses no fear of ill-effects following the operation in young children and claims it is of great advantage, his experience and observation covering several years. When indicated, he fully removes cartilage and bone in undeveloped noses and does not advise makeshift operations for the removal of obstructions but tackles the septum itself.

Brown does not advise the submucous resection, except under very special circumstances, in a patient under sixteen years of age. Yearsley thinks the prejudice against doing a submucous resection before puberty is unjustifiable. Weinberger believes in waiting until facial developments are about complete before operating. The differences of opinion are not indications or contraindications but the lower age limit. The upper age is not such a mooted question, although some do not believe in operating in cases past fifty years of age.

How often do we have one of these youngsters brought in with the history that the tonsils and adenoids have been removed one, two or five years previously with no relief, but on the contrary the symptoms have been exaggerated and the patient is gradually going from bad to worse. Sad but true, these tonsillectomies and adenoidectomies are not limited to having been done by a general man, but many are done by specialists of considerable repute, leaving the patient to suffer from the major malady because he is not fifteen or eighteen years of age.

I do not believe there is sinus trouble in every case of nasal septal deflection, but do believe the great majority of sinus cases are associated with a septal deflection of one character or other.

My experience in submucous resection in children has been over the last six years, the youngest case being not quite seven years, the average being a bit over nine, in a series of fifty-eight cases, and seven being added since this paper was first written. In not one instance has a disproportionate growth between the nose and other parts of the face been noted. The results have been uniformly good, improvements very pronounced and in many cases nothing short of marvels have been obtained in improvement. The causes of septal deflection as to their embryology, etc., have been purposely omitted, these being well understood by all.

I have had three cases in the last year who had had tonsils and adenoids removed without results, the parents having lived in two or three different states with hope of getting climatic relief but failed. These were operated on with complete relief of preexisting symptoms, their ages being eight, nine and thirteen years.

These youngsters come in with various complaints and pathologic findings, some with a plain, uncomplicated septal deflection, some with diseased tonsils and adenoids with septal deflection, some associated with sinus infection, single or multiple, and some with adenoids regrown plus the septal deflection. The case histories herein given are of rather extreme type, associated with absolutely no other pathology.

In attacking this condition with surgery we must be physicians and able to view our patients from every angle, not merely from the standpoint of a specialist. We must not make the error of considering the condition simply as a departure from the normal without inquiring into the conditions that produce the departure. In other words, many observers simply record the fact that the patient shows this or that without determining the relation it bears to some other important and physiologic function. The importance of determining these points must be signalized, if we hope to arrive at a correct diagnosis of our patients.

The deviation found may be but a symptom and to treat it as a substantive affection without determining the conditions that underlie it or the disturbances that it may cause, would seem as strange as for a physician to treat a case of dropsy simply as such without seeking for its cause, or considering the physiologic disturbances in other body tissues.

The Operation. Some advocate only a high resection, others a low one, but it is my opinion that the operator should do all at the initial operation that will likely ever need to be done, as a secondary operation on the nasal septum is next to impossible.

All cases are done in a hospital under general anesthetic, aided by a eustachian catheter as nasal suction. All have a complete submucous resection, except that as large a piece of cartilage as possible is left anteriorly, together with as deep a band as possible back to the attachment with the nasal bones. All are packed with vaselined gauze after drainage openings are made in the flaps and the anterior incision sutured. Patients are kept in upright or semireclining position for twenty-four hours, the packs then being removed, the nose cleaned and dressed at end of the third day.

SUMMARY

1. The number of children needing submucous resection seems increasing.

2. There is no denying the ill-effects of an obstructed nose left alone, nor the good effects of a submucous resection properly done in a child.

3. The time is at hand when we must lay aside our bias or prejudice to performing a submucous resection in children regardless of age.

4. The man who does not do submucous resections in children may well consider himself as missing a very important issue and failing to give his patient the service to which he is entitled.

The following are a few typical uncomplicated case histories:

Case 1. Jackie D., male, age 9 years, referred November 23, 1925, by a general man after he had given him a complete physical examination with negative findings. The special history was that his tonsils and adenoids were removed at age of five years. Nasal breathing was difficult to almost complete obstruction, a lot of head colds of long duration, complete loss of former pep and playfulness, indifferent to his studies and things in general, and a gradual failure in his school work, and month by month receiving poorer grades.

He was wearing glasses OV. +250 Sp. = +100 Ex. 90, which were found correct on rerefraction. His nose showed a badly deflected septum, both to right and left blocking nose. All turbinates were turgescent.

On December 26 a complete submucous resection was done in usual manner. Six months after operation he had fully regained all his lost pep and ambition, took a great interest in everything. Very studious and at top of his class in school. Free normal nasal breathing, free of headaches. To date he is still normal in every respect.

Case 2. Edwin W., male, age 9 years, referred on January 30, 1927, by a general man after a complete physical examination with negative findings, with a history of bronchial asthma, frequent head colds and difficult nasal breathing.

Special history: Tonsils and adenoids out in October, 1924, with marked general improvement. Always a great many head colds and several attacks of abscessed ears in the past. Over the last year he had been having attacks of asthma, lasting several days to a week or more, having to sit in a chair by an open window for sleep.

Examination showed a deflected septum, also a very thick septum together with large middle turbinates, causing a marked upper nasal blocking. Tonsils and adenoids out and nothing else abnormal found.

On February 1 a complete submucous resection was done and both middle turbinates removed. He did not have any asthma during postoperative convalescence and has had none to date, one year later.

His general condition is much improved, has free nasal breathing and has been practically free from head colds.

Case 3. Margaret S., female, age 13 years. Came to me directly on May 14, 1926. Special history, tonsils and adenoids out at age of 8 years, with no relief and a gradual exaggeration of her symptoms.

Had always been a mouth breather, never being able to breathe through her nose. She was somewhat apathetic looking, melancholic and a very poor student in school. Her teeth were prominent, face sharp and pointed, bearing evidence of a nasal obstruction. Somewhat pigeon chested and poor general physical development. Her parents had moved from Colorado to Southern California and from California to Washington with the hope that her health would be better.

A requested general examination revealed nothing. Her special examination was negative throughout, except retracted ear drums and a badly blocked nose, due to a badly deflected septum and very large inferior turbinates, their edges pressing on the floor of the nose.

This girl was always tired and pepless, was nervous and had a great many colds of long duration, in fact seldom without an apparent cold, and sneezed a great deal of the time.

Since operation she has grown and seems like a different girl, always smiling and cheerful and gained considerable weight and development. She has constant free nasal breathing, hardly knows what a cold is and seems to have taken an entirely new hold on life, being free of all preoperative symptoms. Her parents state that since the operation is the only well period she has had from infancy.

THE EXAMINATION OF MINOR FRACTURES AND INJURIES OF THE FOOT*

E. J. Jasper, M.D.
ASTORIA, ORE.

An injured foot is a very common occurrence. An ideal method would be to radiograph every foot injured. But there are many circumstances which make this impossible. Besides, a carefully conducted and systematic examination of the foot, made at the time of the injury and repeated once after an interval of a few days, is almost absolute in the diagnosis of a fracture. At least I have found it so, as the result of eight years of general practice in which fully 2,000 feet were examined. The injuries that I refer to occurred in sawmills and logging camps, where bruised feet and crushed limbs were of daily occurrence.

In general it may be said that a foot should be examined as soon as possible after injury. The limb is more or less numb at first and facilitates the ease of such an examination. If the examination is negative to fracture at this time, a good rule to make, and it might be called the golden rule in minor injuries of the foot, is to repeat the examination on the third or fourth day. At this time a sprained ankle or other injury is usually on the mend, while a fracture becomes more tender, swollen and painful. Stated tersely, it may be said that a sprain or bruise tends to clear up, while a fracture becomes worse with age.

The matter of examining a foot is of no less importance than any other part of the body. It should be systematic and follow a definite procedure. A method has been worked out which has proven equal and occasionally superior to the radiograph. Where the lesion is self-evident as a small cut or bruise, this process need not apply. But in any injury in which there is an uncertainty, traumatic or functional, the following technic is proposed. Under each is a discussion which may be omitted, if one desires technic only. The examination requires about three minutes time.

TECHNIC OF FOOT EXAMINATION

1. Examination of toes. Grasp the foot firmly with one hand and with the other press all five toes downward at once. If there is no tenderness pass on to step No. 2. Any tenderness requires individual inspection. Grasp the toe firmly above and below the point of injury. Pull, bend, push, rotate and move up or down several times; do this carefully. Crepitus will always be elicited in a fracture. Occasionally a broken bone will be found which has been missed by a radiogram anteroposterior and lateral.

Case history. A workman dropped a block of wood on the big toe. The first physician examined the toe and took x-ray films which were negative. After six days the toe became so painful and tender that a second physician was called. Unfortunately he diagnosed it as an unguinal infection and lanced the area about the base of the nail. A week later the man's jaw became swollen from a metabolic streptococcus septicemia.

The above routine toe examination was then applied and crepitus felt instantly. Orders were given to radiograph until the fracture was found. It required five exposures to find the lesion. It was a chipped fracture about the size of an almond pit in the first joint of the big toe. Over this was a small opening from which pus escaped. This was enlarged and drainage established. The patient had a lengthy, severe period of fever, in which another abscess later was opened in the hip with a recovery in two months time.

2. Metacarpal bones. These are examined separately. Begin with the fifth metatarsal. Grasp the head firmly with the thumb and index finger of one hand. With the other hand press strongly up and down the bone, like trying to break a short stick. This will always disclose a fracture of the shaft. A small break in the head of the bone is more difficult to discover. For this, pull, push, try to rotate the bone and bend it up and down.

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* Read before Clatsop County Medical Society, Astoria, Oregon, April 11, 1928.

Crepitus is not easily found, but unusual tenderness and pain at a later period usually indicates a split fracture in the region of the head of the metatarsus.

3. Functional test. Squeeze the foot, using one or both hands. This is not so important in detecting a fracture but it will frequently disclose an obscure case of metatarsalgia. When the patient rises up in the chair from the pain of this lateral compression, one can be reasonably certain of metatarsalgia. At this time it is well to note if there is any flat foot present. If such appears to be the case, have the patient immerse the foot in water and walk in a circle about the room. A widening of the isthmus between the imprint of the heel and the ball of the foot indicates flat foot.

4. The ankle joint. Rock the foot to and fro very gently for several seconds until relaxation is obtained. This should be done in every case, no matter how badly injured. Then bend further in each direction. Crepitus indicates a fracture, while increased tenderness indicates the sides in which the ligaments are loosened in a sprain. Straps are put on in a contrawise direction and the balance of the foot either strapped or bandaged. Care should be taken not to compress the dorsalis pedis artery. Strapping and bandaging the ankle is not always so necessary. Painting the entire foot with tincture of iodine and having the patient immerse same in hot water one-half hour three times a day with elevation and rest of the foot is as effective treatment as any. Iodine prevents infection and is soothing to the foot.

It might be said, further, that there is no one best treatment for a sprained ankle. The treatment varies somewhat per physician, per patient and per sprained ankle. Some physicians use straps or bandage immediately. Others use hot applications of epsom salts or other solution for two or three days, after which they strap, bandage or prescribe a liniment. A few prefer cold water immersions. Where the patient can afford it, a nicely applied huge dry cotton compress bandage with cotton projecting at either end, avoiding any constricting wrappings and the whole foot immobilized in a posterior wire leg splint, reduces the tendency to further swelling and is a comfortable dressing. If a sprain or injury is not severe, strapping may be the best treatment.

5. Malleoli. Examine with both thumbs or with the thumb and index finger of the other hand. Try displacing it in three directions, like moving a twenty pound weight. Crepitus is occasionally elicited. Persistent pain and thickening in this area should arouse suspicion of a fracture. The malleoli are often swollen in sprains as well as in fractures.

6. Fibula, the lower inch. Pain on pressure, tenderness of the first inch of the fibula on the third or fourth day after injury is the surest sign of a fracture. Crepitus is seldom elicited. The first inch of the fibula is the most frequently overlooked fracture of the foot. This is true, even after the radiograph is taken. It is often said, "beware of the fluoroscope in fracture work," which is a good general rule but here is the place for an exception. The fluoroscope with a rotation of the leg before the screen is the best means of confirming this fracture. By rolling the fibula before the screen, the usual depression is made out, opposite which is in practically all cases a small spicule of bone on the innenr side. When the split is once seen, the angle and position should be noted and then a radiograph taken. If for reasons it is not possible to x-ray the foot, the increased pain and swelling at this particular area after a few days time is sufficient to establish a diagnosis of fracture.

7. Shaft of fibula. To examine, press laterally on the fibula in the middle portion. The pressure should be strong enough so that the examiner can feel the bone bend. Any increased or undue tenderness indicates a fracture at some portion of the bone. Now press in the upper and lower portions of the shaft and the exact location of the fracture will be determined. The absence of pain on lateral pressure indicates that there is no fracture present. People come in with a fracture of the shaft more often from a few days to a few weeks after the injury rather than immediately. There is often pain in the ankle and pain on weight bearing. Crepitus is occasionally but not always found, pain being the leading symptom.

In conclusion, a few words may be said about crepitus. There are very exceptionally a few cases of false crepitus. This perhaps is due to the abnormal structure of the joint or looseness of the cartilages present. Very frequently these people have similar joints elsewhere, such as in the neck, shoulder, jaw or hip. It seems to be a characteristic of them. False crepitus is unaccompanied by pain or signs of trauma and is easily differentiated from the crepitus of a fracture which is painful, swollen and red.

The gross lesions, such as fractures of the tibia and complicated fractures are not herewith included, the remarks pertaining only to minor injuries and fractures of the foot.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington and Idaho

Devoted to the Interests of the Medical Profession of the Pacific Northwest

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EDITORIAL

MODERN MEDICAL ETHICS

CALLING CONSULTATION

When shall the family physician call in others to consult and advise him? This problem is a frequently recurring one. It is relatively easy of solution, if the patient suffers from disease of some special organ and the disease is well localized. For instance, if the patient has some disorder of the eye, the attending physician usually knows at once that he is not especially competent to treat it and is quite ready to call in the ophthalmologist. If he does not do so, most people these days are well aware that there is a specialty of ophthalmology and they demand a consultant who follows it. But if the disease is an obscure one of the internal organs, the family is not so well equipped to make a decision and there is sometimes a tendency on the part of the attending physician to try to manage the case alone. Even though he knows he does not fully understand the trouble, oftimes he believes he can do as well as the next man.

In the cities the problem of consultation is not as difficult as in the country. In small towns there may be but two or three physicians and, should one of them get the habit of calling a competitior in consultation, he realizes the danger that he may be enhancing the other man's reputation at the expense of his own. But in the city this difficulty does not often arise for the reason that here are men specially trained in all lines who may be called on for help in difficult cases, and the general practitioner may obtain assistance that will genuinely assist, without danger of minimizing his own importance.

In a general way, the best equipped practitioners are most ready to call in consultants. They are sure of themselves, self confident and have no inferiority complex. Even though they feel they are able to manage the case satisfactorily, they are ready to call consultants at the first hint of dissatisfaction on the part of the patient or his family. They realize that, if a patient lacks faith, they are better off without him. Or if things go wrong, they believe that good consultation divides responsibility and good consultants help to smooth the pathway for them.

Trifling cases do not need consultation and no wise physician calls in such assistance without good reason. Even severe cases many times do not benefit from consultation. But he is a wise physician who, scenting disatisfaction, is ready to seek or call someone who, having special training, will probably understand the problem and may be able to give help or if not, will make the family feel that everything reasonable and proper has been done and that nothing may be added to combat and defeat the Grim Reaper. No special skill is necessary, as a rule, in settling the problem but only good common sense and he who possesses an abundance of that always desirable quality is less apt to fall into error than is he who prides himself on supererudition.

On calling of consultation in cases in which the physician rather than the patient desires it, little need be said except to point out that frequently, when the physician asks for consultation, the family is inclined to hold him responsible, that is, they are often unwilling to pay the consultant's fee on the ground that he was called for the benefit of the physician rather than of the patient. This attitude, of course, is only rarely noted with educated persons but is common practice among the ignorant. Though it is well to protect oneself against it, every physician should realize that, if he wants consultation, whether the family desires it or not, he is entitled to have it and he is neglecting his duty if he fails to request it. If the patient is poor and cannot pay, the consultant should be as willing to render services gratis as is the average general practitioner to serve patients who are in real need without regard to compensation.

COST OF MEDICAL CARE

During recent years there has been much agitation in all parts of our country regarding the great expense attending sickness and the period of convalescence. The fact has frequently been emphasized that the great bulk of the population possessing moderate means, neither burdened by poverty nor riches, encounters the most difficult struggle to meet the cost of illness which sooner or later will come to everyone. Some thoughtless individuals presume to attribute the situation to the avarice of the members of the medical profession and hospital management. Any considerate person, however, will readily realize the great cost involved in acquiring a medical education and the continuous expenditure devolving upon the maintenance both of physicians' practice and hospital management. While a few physicians in any community may secure large incomes, the revenues of average physicians do not compare with those secured in most lines of business and some other professions. In fact, the inadequate returns from medical practice is one of the causes for dissatisfaction arising in a consideration of the cost of medical care.

In order to clarify the situation and obtain adequate information in this puzzling problem, a movement has been organized whose purpose is to investigate all phases of the question of sickness and its cost as it affects the general public and the medical and dental professions. The committee appointed last year, which will devote five years to the investigation of this subject, is composed of forty-two persons, fourteen being private practitioners of medicine, six engaged in public health work, eight from various institutions and organizations, five economists and nine persons associated with public welfare enterprises. It is stated that this committee will approach the problem without bias and without preconceived ideas as to solution of the problems to be studied.

It is proposed that the committee investigate the extent to which the burden of the cost of medical care and the incidents of sickness falls upon various economic and social classes in various communities and the aggregate cost to the individual family; the proportion of the cost of medical care borne by the patient, the community and the physician himself; the financial returns to physicians with the various types of practice in particular areas and under particular conditions, together with other features of medical and hospital care. This movement is sponsored by the American Medical Association, the United States Public Health Service, Metropolitan Life Insurance Company, supported by financial foundations and funds which will meet the necessary outlay. It is needless to state that the medical profession as a whole will await with much interest the investigations and conclusions of such an investigation.

Carcinoma of Islands of Pancreas. After two and a half years of gradually increasing severity of symptoms, the patient whose case is reported by William Thalimer and Francis D. Murphy, Milwaukee (*Journal A. M. A.*, July 14, 1928), developed a state of almost constant semistupor accompanied by frequent convulsions and marked hypoglycemia until death followed, apparently from exhaustion. At necropsy the only significant pathologic lesion found was a small primary tumor of the pancreas.

PACIFIC NORTHWEST ANNUAL MEETING

The seventh annual meeting of Pacific Northwest Medical Association held at Tacoma last month presented an interesting program of papers with other attractive features which have become characteristic of these gatherings. The program included twelve men from the faculties of leading medical schools of this country together with one each from McGill and Norway. One noticeable feature of the speakers was their youth which in fact is characteristic of many of the leading medical educators on our teaching faculties. While programs of this character present discussions on well known subjects with facts familiar to every physician, the special attraction of these gatherings lies in the presentation of the newest developments in the various departments of medical practice which arise from year to year. Among all professions the medical is the least static. What is new today may be old tomorrow. The well accepted theory of this year may be entirely replaced by new discoveries of the next. This fact, in reality, is one of the fascinating and attractive features of medical practice. These great annual gatherings are of supreme importance to the medical profession of our Northwest section by reason of presenting to our medical men and women an epitome of the new developments and discoveries of the day. It might appear invidious to select individual speakers or papers for special comment. Suffice it to say that the men on the program, together with their messages on important medical topics, made an abiding impression upon their auditors that will cause them to be remembered over a long period of time.

The registration for this meeting showed a goodly number of representatives from all of our Northwest states and Canada. Not the least valuable feature of the gathering was the opportunity for meeting friends whom one seldom encounters except on occasions of this character. It may be superfluous to comment on the ideal climatic conditions of Puget Sound for any sort of summer convention. Even though the skies may be somewhat concealed by smoke or mist from time to time, the freedom from heat is most acceptable to visitors from other sections of the country. Since the American Medical Association will meet next year in Portland, the regular meeting of this organization will be suspended, its next session being scheduled for Butte in 1930.

THE ANNUAL MEETING IN SEATTLE

The program of the annual meeting of Washington State Medical Association, scheduled for Seattle, August 27-30, presents some interesting features. Since golf bulks so large in the lives of doctors of the present age, the first day of the official gathering will be devoted to this ancient and universally popular game. The first day of the scientific program presents papers by members of the association, grouped in urologic and orthopedic sections. Then follow two days of papers by well known members of the profession from other states. The meeting will be held in the Junior Ball Room of the Olympic Hotel. The special social features will center about a banquet the evening of the 29th and a dinner dance the evening of the 30th.

PROGRAM

Monday, August 27

Washington State Medical Association Golf Tournament.
Dinner at Inglewood Country Club.

Tuesday, August 28

9 a.m. Board of Trustees and House of Delegates. Reports of Officers and Committees.

UROLOGIC SECTION

9 a.m. Stricture of Female Urethra. Dr. Arvid Anderson, Aberdeen.
Review of Cases of Diverticulum of the Urinary Bladder. Dr. Charles E. Teel, Bellingham.
The Collings Operation. Dr. C. F. Engels, Tacoma.
The Operative Treatment of Urethral Stricture. Dr. Alexander Hepler, Seattle.
Perinephritic Abscess. Dr. Alexander Peacock, Seattle.
12:30 p.m. Luncheon at College Club. North Pacific Branch of American Urological Society.

ORTHOPEDIC SECTION

2 p.m. Shoes (Lantern Slides). Dr. Joe Brugman, Seattle.
The Problem of Ankylosed or Partially Ankylosed Joints. Dr. C. F. Eikenbary, Seattle.
Treatment of Injured Spines (Lantern Slides). Dr. Roger Anderson, Seattle.
Treatment of Fractures of the Extremities by the Three-piece Plaster of Paris Cast. Dr. D. A. Murray, Seattle.
Injuries to the Spine in the Cervical Region. Dr. M. Langworthy, Spokane.

Wednesday, August 29

10 a.m. Pyelonephritis. Dr. Arthur H. Crosbie, Boston, Mass.
Discussion by Drs. F. H. Brush, Yakima; A. H. Peacock, Seattle; C. E. Teel, Bellingham; C. E. Butts, Spokane.
Diagnostic Methods in Proctology for the Surgeon and the Internist. Dr. Louis A. Buie, Mayo Foundation.
Discussion by Drs. C. A. Hagyard, Seattle; G. C. Miller, Seattle; A. J. Hilton, Yakima; H. D. Dudley, Seattle.
2 p.m. Intestinal Obstruction. Dr. Dean Lewis, Johns Hopkins Hospital.
Discussion by Drs. A. A. Matthews, Spokane; C. W. Sharples, Seattle; H. J. Whitacre, Tacoma; J. C. Lyman, Walla Walla.
Some Observations on Prostatectomy. Dr. Arthur H. Crosbie, Boston, Mass.
Discussion by Drs. O. A. Nelson, Seattle; C. F. Engels, Tacoma; A. B. Hepler, Seattle; J. T. Whithy, Seattle.
7 p.m. Banquet, Olympic Hotel.

Thursday, August 30

9 a.m. House of Delegates. Election of Officers, etc.
10 a.m. The Surgical Lesions of Bones. Dr. Dean Lewis, Johns Hopkins Hospital.
Discussion by Drs. M. Langworthy, Spokane; S. L. Caldbick, Everett; L. L. Goodnow, Aberdeen; W. A. Taylor, Ellensberg.
Heredity. Prof. Trevor Kincaid, University of Washington.
12 m. Annual Meeting and Luncheon of Public Health League of Washington.
2 p.m. Medical and Surgical Treatment of Anorectal Diseases. Dr. Louis A. Buie, Mayo Foundation.
Discussion by Drs. Arthur Crookall, Seattle; F. A. Bird, Olympia; J. H. O'Shea, Spokane; Elmer Hill, Walla Walla.
Uterine Fibroids. A Study of Six Hundred Twenty-five Cases. Dr. Frank Lynch, University of California.
Discussion by Drs. W. D. Kirkpatrick, Bellingham; A. E. Gerhardt, Wenatchee; C. A. Ward, Spokane; W. C. Woodward, Seattle.
7 p.m. Dinner Dance, Olympic Hotel.

THE OREGON ANNUAL MEETING

The fifty-fourth annual meeting of Oregon State Medical Society will be held at Portland, September 20-22. The papers presented will be limited to members of the society, although one or two eastern men of note may appear on the program. The annual banquet will be held the evening of the second day. In addition the following features are scheduled: Annual meeting of the Women's Auxiliary, displays illustrating the activities of the society and the American Medical Association, scientific and commercial exhibits, exhibits of art by Oregon physicians, tea and theater party for visiting ladies. All of these entertainments will be in charge of the Women's Auxiliary.

The morning of the first day will be devoted to meeting of House of Delegates and clinics at various hospitals. In the afternoon is scheduled the Second Annual Oregon Golf Tournament. In the evening a public meeting will be held, the subject being "Keeping Fit." There will be a demonstration of periodic health examinations, followed by lantern slides and motion pictures, including the film, "The Life of Pasteur." The program for the second and third days will include meetings of House of Delegates and reading of papers which, thus far received, constitute the

PRELIMINARY PROGRAM

An Analysis of One Thousand Prenatal Clinic Cases. C. J. McCusker, Portland.

A Preliminary Report on the Absorption of Glucose Introduced by Rectum. Charles E. Sears and John R. Montague, Portland.

Some Errors in the Diagnosis of Cancer. Otis B. Wight, Portland.

Hematuria. Franklin P. Johnson, Portland.

Brain Abscess of Otitic Origin. Frederick A. Kiehle, Portland.

Surgical Collapse of the Lung. Jay R. Coffey, Portland.

The Differential Diagnosis of Thoracic Pain. Marr Bisaillon, Portland.

Paransal Sinus Infection in Relation to Diseases of Childhood. Guy L. Boyden, Portland.

Resume of the Results of the Use of Myrtillin and Neo-Synthalin in Diabetes. Blair Holcomb, Portland.

The Prognosis in Acute Coronary Occlusion. Albert L. Severeide, Portland.

Cardiac Shapes. T. Homer Coffen and George McKhann, Portland.

The Rationale in Our Present Treatment of Peptic Ulcer. Wesley E. Gatewood, Portland.

Back Pain and Its Treatment. Harry C. Blair, Portland.

Repair of Old Lacerations Following Childbirth. Grant S. Beardsley, Eugene.

Malta Fever in Oregon. G. C. Bellinger, Salem, and William Levin, Portland.

The Management of Sterility in Private Practice with Reference to Special Methods. Albert Mathieu and Goodrich C. Schauffler, Portland.

Congenital Pyloric Obstruction: Prophylaxis, Treatment. C. Ulysses Moore, Helen G. Dennis, and Jessie L. Brodie, Portland.

The Gwathmey Method of Synergistic Anesthesia in Obstetrics. Charles E. Hunt, Eugene.

Carcinoma of the Lower End of the Esophagus. J. Earl Else, Portland.

Principles and Technic in the Treatment of Colles' Fracture. Otis F. Akin, Portland.

Cysts of the Labia Minora. C. Julian Lunsford and Goodrich C. Schauffler, Portland.

Postthyroidectomy Complications and Sequelae. Dean B. Seabrook, Portland.

Fifteen Years Experience with Spinal Anesthesia. George Norman Pease, Portland.

A University Health Service as an Educational Force for Scientific Medicine. Fred N. Miller, Eugene.

THE YELLOWSTONE MEETING

It is scarcely necessary to remind members of Idaho State Medical Association of the annual meeting at Yellowstone Park, August 27-29, in connection with the professions of Montana and Wyoming, all combined in a tristate meeting. This is expected to prove the greatest meeting these state associations have staged. It will be held at Canyon Hotel near the Yellowstone Canyon, one of the most striking and beautiful natural phenomena to be found in our country. The program published in last month's issue provides for the reading of papers at morning sessions, reserving afternoons for sightseeing. The wonders of this park are incomparable. Everyone should avail himself of the opportunity to visit this wonderful region, besides taking advantage of the attractive medical program.

MEDICAL NOTES

American College of Physical Therapy. At Chicago, October 8-13, will be held the Annual Meeting of the American College of Physical Therapy together with the Clinical Congress on Physical Therapy. The promoters of this meeting announce this will be the most important and largest gathering of the kind which has been held in this country. All principal phases of physical therapeutics will be featured and anyone interested in this line of practice will find it very advantageous to be present at this time.

Distinguished foreign guests will be Dr. Carl Sonne of the Finsen Medical Light Institute, Copenhagen, Denmark; Prof. Dr. Donato de Francesco, Venice, Italy; and Dr. A. R. Friel, London, England. In addition, leading physicians and teachers in this line of work through all parts of North America will appear on the program.

OREGON

Lectures in Laryngology. During the last two weeks of August, Dr. Richard Waldapfel, Assistant to Professor Hajek of Vienna, will deliver a course of lectures in laryngology at Portland. There will be a one hour lecture each evening, followed by a half hour devoted to demonstration of specimens, slides, questions, etc. His lectures will cover pathology and treatment of important diseases of the larynx. Dr. Waldapfel is probably the most popular instructor in Vienna. Besides his capabilities as a teacher, he has a captivating personality, his English being of a superior quality. Following the Portland lectures, he will deliver the same course in Seattle during the first two weeks of September.

The Pacific Coast Roentgen Ray Society held its annual meeting in Portland on June 22. Dr. M. F. Dwyer, Seattle, read a paper on the "X-ray Diagnosis of Benign Gastric Tumor." Dr. W. S. Wehrly, Santa Ana, Calif., discussed "Thyroiditis." A report of the roentgenologic section of the American Medical Association convention, held recently in Minneapolis, was read by Dr. Harold B. Thompson of Seattle.

Oregon Leads in Infant Health. Government statistics which have recently been published show that Oregon leads all other states of the Union in regard to low infant mortality. During the past six years popular education in the hygiene of maternity and infancy has been carried on in this state, under the provisions of the Sheppard-Towne Act, and to this campaign is to be attributed no small part in the lowering of the infant death rate from 58.5 to 52.5 per 10,000 births.

Medical Golfers Meet. Physician golf enthusiasts of Seattle and Portland met in the latter city on June 28. Dr. D. H. Houston of Seattle carried off first honors in the tournament.

New Hospital for Juvenile Home. The new Juvenile Hospital for Girls, which is to be operated in conection with the Louise Home for Girls at Portland, was dedicated on June 29. Both institutions are operated by the Pacific Protective Society, a member of the community chest. The hospital building is a modern, two story, brick structure and cost $60,000.

Hospital Planned for Curry County. Mr. and Mrs. Carl Smedburg, proprietors of the Gold Beach Hospital, have announced plans for the erection of a modern twenty-four bed community hospital at Gold Beach. The Gold Beach Exchange Club and prominent citizens of that city have pledged their support to the proposed institution.

To Serve Naval Interneships. Three 1928 graduates of the University of Oregon Medical School, all residents of Portland, have been ordered to report to the San Diego Naval Base Hospital, where they will enter upon service as internes with the naval rank of junior lieutenant. They are Drs. Edward E. Evans, Vernon Hockett and Charles Robertson.

Assigned to Veterans' Bureau. Dr. Matthew Moorehead, of the United States Veterans' Bureau, has been assigned to the Veterans' Hospital at Portland.

Dr. A. K. Harris, who has been associated with the Keizer Brothers Hospital at North Bend for the past year, has left for Boston, Mass., where he will engage in postgraduate study.

WASHINGTON

Annual Lectures. The twelfth annual postgraduate medical course was held at the University of Washington on July 16-20. Approximately three hundred physicians were in attendance. The lectures in medicine were delivered by Dr. James B. Herrick, professor of medicine at Rush Medical College; those in surgery by Dr. Frank H. Lahey, until recently professor of surgery at Harvard University Medical School. The subject of physiology was discussed by Dr. Andrew C. Ivy, professor of physiology in the medical department of Northwestern University. Dr. J. Whitridge Williams, professor of obstetrics at Johns Hopkins University, was the lecturer on obstetrics. Diseases of the eye were covered by Dr. John Martin Wheeler of Bellevue Medical College. Dinners for the visiting lecturers were held by the alumni of their respective schools. On the evening of June 17, the annual banquet was held at the Olympic Hotel.

Basic Science Examination. The recent basic science examination, held at Seattle, July 12-13, was attended by fifty-eight applicants, of whom four were osteopaths and five chiropractors, the remainder being medical doctors. Forty-seven medical doctors, three osteopaths and two chiropractors made passing grades. This examination was followed by those of each of the three classes of practitioners, the results of which are not at present available.

Veterans' Hospital Assured. Brig. Gen. Frank T. Hines, director of the United States Veterans' Bureau, was a recent visitor in Seattle and Tacoma. He announced that the construction of a $220,000 Veterans' Bureau Hospital at American Lake is now assured. The new institution will be able to care for one hundred patients, and will be in line with the aim of the Veterans Bureau ultimately to care for the medical and surgical ailments of all veterans, whether or not they were incurred in service.

Visitor from Norway. Dr. Gulbrand Lunde of Oslo, Norway, was the guest of honor at a special meeting of the King County Medical Society held on July 11. He is making a trip to the Pacific Coast for the purpose of pursuing a study of the relation of the iodine content of native fish to the local incidence of goiter.

Honored by Health Association. Dr. E. T. Hanley, city health commissioner of Seattle, has been elected vice-president of the recently organized Pacific branch of the American Public Health Association. The next annual meeting of the Pacific branch will be held in Seattle.

Philadelphia Surgeon Honored. Dr. Temple Sedgwick Fay of Philadelphia was the guest of honor at a dinner and meeting of the Seattle Surgical Society on June 27. Dr. Fay, a native of Seattle, whose recent work in the field of neurologic surgery has attracted wide attention, addressed the members present on "Cranial and Cervical Lesions."

Tuberculosis Ward Located at Georgetown. In spite of considerable opposition from residents in the surrounding districts, the Board of Commissioners of King County have determined to proceed with their plans for the erection of a tuberculosis ward at the site of the present King County Hospital at Georgetown. An appropriation of $18,500 was recently made for this purpose.

Hospital Receives Library. The widow of the late Dr. N. M. Baker, pioneer Spokane physician, has donated his private library to the Deaconess Hospital at Spokane. The collection consists of about two hundred fifty well selected volumes on medical and surgical subjects.

Site of Medical Building Announced. The site of the new eleven story Medical Arts Building at Tacoma, plans for which were announced last month, has been determined. The structure will occupy a plot of ground at the northeast corner of South 10th Street and Pacific Avenue.

New Internes Appointed. Dr. L. S. Greenwood, a graduate of the University of Illinois College of Medicine, and Dr. L. A. Dewey of the Department of Medicine of the University of Nebraska, have entered service as internes at the Deaconess Hospital, Spokane.

Change of Internes at City Hospital. Seven physicians, who have completed a year's interneship at the Seattle City Hospital, have announced their plans for the future. Dr. C. W. Lemery has received a fellowship at the Mayo Clinic. Dr. F. C. Adams will locate for practice at Klamath Falls, Ore. Dr. L. A. Schueler will go to Port Townsend. Drs. L. A. Campbell, D. G. Corbett and D. O. Kraable plan to open offices in Seattle.

The following physicians have entered upon interneships at the hospital: Drs. A. A. Morrison and M. E. Wilmuth of the University of Nebraska Medical

School; Drs. C. E. Carter and E. V. Ogievsky of the University of Oregon Medical School; Dr. Horace Skinner of the Medical Department of Washington University, St. Louis, and Drs. Harry Beck and Alfred Valle.

CONSTRUCTION OF HOSPITAL STARTED. Work was begun early in July on the erection of the new $60,000 government hospital for Indians at Toppenish.

OAKHURST SANITARIUM CROWDED. Dr. Howard L. Hull, director of the Oakhurst Tuberculosis Sanitarium at Elma, recently told members of the Elma Kiwanis Club that the sanitarium facilities at present are severely overtaxed. Patients are usually required to wait five or six months before they can be admitted on account of lack of beds.

WHITMAN COUNTY MEDICAL SOCIETY held its regular quarterly meeting in Colfax on June 19. A symposium on "Acidosis" was held, the subject being presented by Dr. J. Edward Preucel. Discussion was opened by Drs. Dolson W. Palmer of Oakesdale and Paul G. Weisman of Colfax.

The society determined to continue its public health activities in the form of radio health talks from the Washington State College Station. The next meeting will be held on or about September 20 at Colfax.

DR. J. H. BLAKE and Mrs. Blake of Wenatchee narrowly escaped death by drowning in Lake Chelan on July 11. They were engaged in trying out a new launch when the craft began to leak and in a short time capsized. Fortunately their signals of distress were seen by the captain of a passing steamer which came to their rescue.

DR. FREDERICK SMITH of the United States Veterans' Bureau Hospital at Tacoma has been transferred to the Chicago district.

DR. GEORGE DAVIS, for the past fifteen years a practitioner at Kirkland, has moved to Amity, Oregon, where he will engage in practice.

DR. THOMAS G. SUTHERLAND, formerly a member of the staff of the Virginia Mason Hospital, Seattle, has located at Centralia where he has become associated with the Nugent General Hospital.

DR. ROSS D. WRIGHT, surgeon at the Northern Pacific Railway Hospital at Tacoma, was seriously injured June 19 in an automobile accident on the Pacific Highway.

MEDICAL WEDDING. Dr. William H. Hazeltine, Spokane, assistant medical director of the Edgecliff Sanitorium, was married to Mrs. Burgess of that city on June 30.

IDAHO

HOSPITAL STAFF ENTERTAINED. The medical staff of the Mercy Hospital at Nampa were hosts to the staff of the Holy Rosary Hospital at Ontario at a dinner at the Dewey Palace grill at Nampa on June 14.

MEDICAL VISITOR FROM IRELAND. Dr. Eileen Boyd, a graduate of Trinity College, Dublin, Ireland, was a recent visitor in Boise. She has recently completed a year's service at the Hospital for Sick Children at Toronto, Ontario.

MEDICAL WEDDING. Dr. Waldo Homan and Miss Annette Leonard, both of Burns, were married on June 27.

OBITUARIES

DR. FREDERIC V. SHUTE, Bellingham, Wash., aged 48 years, died in his office June 18 of shock following a fractured leg. He was born in 1880 and graduated from the University of Colorado School of Medicine, Boulder, Colo., in 1903. He had practiced in Bellingham for twenty-four years, and was at one time county health officer of Whatcom County.

DR. DAVID B. HARVISON, Seaview, Wash., died at his home June 26, aged 66 years. He was born in Iowa in 1860 and graduated from Bennett Medical College, Chicago, in 1895. He located at Palouse in 1906 and practiced there until 1917, when he entered the United States Army Medical Corps. After the war he returned to Palouse where he remained until 1920, when he moved to Seaview on account of ill health.

DR. MILLER EDWIN PRESTON, Spokane, Wash., died suddenly at his home on June 22, at the age of 48 years. He was born in 1879 and graduated from Denver and Gross College of Medicine in 1903. He had been engaged in practice at Spokane for the past six years and was an official physician for the Moose Lodge.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

THE DUODENUM. Medical, Radiologic and Surgical Studies. By Pierre Duval, Jean Charles Roux, and Henri Beclere of the Surgical Clinic, Faculty of Medicine, Paris. Translated by E. P. Quain, M.D. Cloth, 212 pp. $5.00. The C. V. Mosby Co., St. Louis, 1928.

This is a most interesting monograph on a very important subject and one in which frequent mistakes are made in reference to diagnosis, i.e., diagnosis by radiography of lesions in the region of the gallbladder and duodenum. The book is illustrated throughout both by reproductions of radiograms and by outline sketches of the contour of the duodenum and gallbladder (when visible), and by citation of the history and operative findings in the cases described. Formerly it was a "toss up" (and this method seemed quite as reliable), whether a radiographic diagnosis of ulcer did not turn out to be cholecystitis. This state of affairs is completely comprehensible when the numerous cases in the book are studied, showing the great frequency of periduodenitis with adhesions associated with cholecystitis. Not only this but periduodenitis and adhesions follow cholecystectomy when not present before removal of the gallbladder. The authors, therefore, advise that the duodenum be studied carefully not only before but after cholecystectomy, when digestive symptoms follow the operation. It frequently happens that the duodenal cap is somewhat deformed, following cholecystectomy without any untoward symptoms resulting, but these occur when the deformity of the bulb is sufficient to cause stenosis. The writers believe that periduodenitis is the most common cause of late pains and digestive troubles following cholecystectomy.

It is advised that greatest care at operation on removal of the gallbladder be done to prevent adhesions and in some cases it may be advisable to do gastroenterostomy as well as cholecystectomy when there is evident duodenal stenosis. The short-circuiting operation is advised after cholecystectomy, when radiography shows stenosis of the duodenum.

There follows a discussion of essential periduodenitis caused by congenital or acquired bands of unknown etiology, producing duodenal stenosis and relieved by gastroenterostomy in most cases. Vascular compression of the third portion of the duodenum by the superior mesenteric and colica media is considered in great detail. Vomiting of bile in large amounts, pain and epigastric distention, relieved by the knee chest position, are characteristic. General intoxication with sallow, dry skin, oliguria and acidosis accompany the condition. The radiologic sign in these cases is dilation of the duodenum to the right of the midline of the body with disappearance of the duodenal retention when the patient lies on the belly. The preferable treatment is duodenojejunostomy. The technic (at various sites) of duodenojejunostomy is described in detail, and the combination of this operation with gastroenterostomy in the presence of both stenosis of the third portion of the duodenum and duodenal ulcer. The only criticism that might be fairly made in regard to the common occurrence of painful digestive symptoms following cholecystectomy in the hands of the author is that their technic may have been faulty as they found periduodenal adhesions and stenosis the most frequent cause of postoperative trouble. It does not appear to be the case in the large cliincs in this country but rather lesions involving the biliary tracts or pancreatic insufficiency.

The cases herein reported should receive the credit of having been studied most carefully from the radiologic standpoint, although few in number compared to those reported from our own large clinics. There is a clear review of the deformities of the duodenal bulb in duodenal ulcer. The work closes with a description of the peculiar toxicity caused by duodenal stasis and shown by migraine, bilious vomiting and sometimes diarrhea.

The monograph is an exceedingly careful study of a limited number of cases of various lesions of the duodenum, in which the radiologic examination is especially stressed and the surgical aspects thoroughly discussed and exemplified by many clinical cases. It is a beautiful example of French precision applied to clinical medicine and is ably translated into clear and simple English.

Winslow.

Dictionary of American Medical Biography. Lives of Eminent Physicians of the United States and Canada, from the Earliest Times. By Howard A. Kelly, M.D., LL.D., Baltimore, and Walter L. Burrage, A.M., M.D., Boston. 1364 pp. $12.00. D. Appleton & Company, New York and London, 1928.

This volume contains two thousand and forty-nine biographical sketches of eminent physicians of the United States and Canada from the earliest times down to January 1, 1927. It represents the labor of the authors over a period of twenty years devoted to the gathering and reconstructing of concise biographies of distinguished physicians of the United States and Canada. One would naturally inquire the basis on which one's history might be included in this notable work. The standards given are: What did he do for others? Did he advance the science or the art of medicine? Did he teach, write, devise apparatus or enter public service, Some early botanists and many pure scientists were physicians, some of whom have been included in this volume.

Many biographies herein presented have appeared in a previous smaller volume but some three hundred new names are included. Most of these sketches are concise, presenting the main features of the lives of noted physicians. Necessarily others, whose activities have been wide-spread and especially distinguished, are featured at greater length. This dictionary is a monument to medical endeavor in America. For a book of reference, it will prove invaluable. Everyone at times will desire to obtain data concerning the outstanding members of our profession. Such information will be obtainable from this valuable book of reference.

Gonococcal Urethritis in the Male, for Practitioners. By P. S. Pelouze, M.D., Associate in Urology and Assistant Genito-Urinary Surgeon at the University of Pennsylvania. Octavo volume of 357 pages, illustrated. Cloth, $5.00. Philadelphia and London: W. B. Saunders Company, 1928.

It is characteristic of many text-books that the authors take the form, often the substance of previous works on the same subject, add the recent advances under the various headings, perhaps a few original ideas and produce a repository of information, encyclopedic but confusing when the reader seeks real guidance. Here at last is a monograph on gonorrhea in the male that gets off the beaten paths. "It is a simple story, simply told," but has behind it a disregard for some of the idols that have been worshipped for years, a searching investigation of the too readily accepted dogmas and observations and conclusions that are borne out by laboratory research and a large clinical experience.

The theme is that most of the difficulties encountered in curing gonorrhea and most of its complications are the result of faulty treatment based on misconceptions, the chief of which is that bactericidal action of drugs is an important factor in producing a cure. Vigorous treatment, trauma and the patient's misconduct contribute largely to all the complications and to chronicity. This idea is developed in a most readable manner. There is a valuable section on the gonococcus and its peculiarities.

Among other things the conception that it is extremely thermo-sensitive is refuted. It will survive upon good culture media twenty-four hours in the ice box and one-half hour in a water bath at 45° C. and in a subculture at 46° C. Its surviving in an unnatural environment, the test tube, at such a high temperature as 113° F., throws some doubt on the effect of the various thermal treatments, especially since we are combating the gonococcus in its natural habitat, the urethral mucosa.

The graphic charting of urine trends as advocated is of distinct value in the study of the clinical course of the disease and in guiding the treatment. A simple plan of treatment is outlined in detail both for the ordinary and the complicated cases. There is a very interesting analysis of forty-eight case histories, showing the reasons for the complicated cases and their management. Although this book is different, there is nothing in it that is not sound or rational. Its style is fascinating and the book must be read to be appreciated. HEPLER.

TOBACCO AND PHYSICAL EFFICIENCY. A Digest of Clinical Data. By Pierre Schrumpf-Pierron, M.D., Professor of Clinical Medicine, University of Cairo. Published under the Auspices of the Committee to Study the Tobacco Problem. 134 pp. $1.85. Paul B. Hoeber, Inc., New York, 1927.

This volume does not attempt to give results of original scientific investigations but presents a succinct summary of the literature relative to the effects of tobacco on the human system. After considering the chemical constituents of tobacco, there are chapters dealing with its effect on the nervous, circulatory, respiratory, digestive and genitourinary systems. It is stated that nicotine, if indulged in too freely, has a toxic influence upon the heart. Used in too large amount it may weaken the heart's action without inducing myocardial impairment. While alcohol is more dangerous than tobacco in its effect on the nervous system, its result may be intensified by the use of tobacco.

Some writers are quoted who claim that tobacco stunts the effect of childhood growth, as shown by child workers in tobacco factories, while another author concludes that tobacco smoke delays the development or destroys the tubercle bacillus, the pneumococcus, the staphylococcus, etc. The conclusion of the author is that a sound individual may bear what is for him moderate doses of tobacco without injury, but immoderate use brings on a series of disturbances, first functional, then organic, some of which may be serious.

STRABISMUS, Its Etiology and Treatment. By Oscar Wilkinson, A.M., M.D., D.Sc. Surgeon in Chief, Washington Eye, Ear Hospital, Washington, D. C. Cloth, 240 pp. $10.00. Illustrated. The C. V. Mosby Co., St. Louis, 1927.

The value of this monograph lies in the comprehensive presentation of the subject, beginning with the history of the study of strabismus in the time of Hippocrates and continuing to the present time. The various theories as to the etiology of squint—muscular, accommodation, fusion and nervous—are presented with their arguments pro and con, with the author favoring the nervous theory. The examination of the patient with proper classification of the type of squint is considered of sufficient importance to demand several chapters. All this is only preliminary to the real purpose of the work which is to advocate the early and energetic treatment of the strabismic child. He condemns the "watchful waiting" attitude of many physicians and then proceeds to the presentation of the many operative and nonoperative methods of treatment. While there is a wealth of reference, in fact, everything worth while ever written on the question is drawn upon, it is done in such a way that the abundance of references is not in the least confusing to the reader. Sixteen case reports with complete histories, photographs, and methods of treatment make up the final chapter. BRUGMAN.

THE COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION FOR 1927, Volume XIX. Edited by Mrs. M. H. Mellish and H. Burton Logie, M.D. Octavo volume of 1330 pages with 412 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $13.00 net.

It is always with anticipated pleasure that we greet the latest volume of the Collected Papers of the Mayo Clinic, as it is certain to contain matter of great practical and scientific value in most departments of medicine and surgery and represents the best practice known to the profession at the present time. While this is an epoch of specialists, it is but a passing phase in medicine, because history reveals that such epochs of specialism have appeared in cycles at intervals of 500 to 800 years, as pointed out by Dr. Charles Mayo in his address on broadmindedness. So that this volume is of almost equal value to all members of the profession, unless one belongs to that unfortunate class of specialists that Dr. Baker has described as devoting itself to more and more of the less and less.

In a collection of subjects so vast the reviewer naturally turns to matters in which he is most interested. Kirklin, writing on cholecystography, states that the technic in use consists in giving the iodin salt of the dye in doses of from 2.5 to 5 gms. in plain gelatine capsules after a fat-free evening meal, and taking films afterwards at the 14th, 16th and 20th hours. The patient fasts after taking the dye, except drinking some water, until the second film is taken at the 16th hour and then a glass of an egg-milk-and-cream mixture is ingested to test the emptying function of the gallbladder. Since this paper was written it has become the custom for Kirklin to give the dye in liquid form in a glass of grape juice, and a similar preparation is now sold as tetradol. The chief cholecystographic signs of gallbladder disease are absence of or faint shadows. In 250 operative cases where gallstones were found, the cholecystographic diagnosis was correct in 98.5 per cent of cases, but in only 30 per cent of these were the gallstones visualized radiologically. Where the gallbladder shadow was persistently faint but not absent, a diagnosis based on this fact was correct to the extent of 88.8 per cent of cases.

In a group showing very slight signs of cholecystitis at operation the cholecystography was 66.6 per cent correct. But normal cholecystograms in suspected cholecystic disease gave diagnostic errors in 30 per cent of 121 patients submitted to operation. While giving the dye intravenously is more certain to reveal a gallbladder shadow, it would seem on this very account to render it probable that more normal shadows would be found in patients with definite cholecystitis. It is shown that the chief source of error (41 per cent) in cholecystography was in the presence of duodenal ulcer. This is unfortunate because duodenal ulcer is the lesion that most often simulates gallbladder disease clinically. Hines has recently affirmed that the gallbladder is not visualized by cholecystography in cases of achylia and this matter deserves further study. When cholecystography gives results at variance with clinical findings, it is always wise to repeat the cholecystography. Again, when a case is clinically cholecystitis, one may wisely ignore a negative cholecystogram.

"The Medical Treatment of Diseases of the Liver and Bile Passages," by Snell and Weir, is an excellent review of the subject and only exhibits the futility of medical treatment in cholecystitis. It describes the specific treatment of luetic disease and that of cirrhosis by the use of novasurol and ammonium chloride or nitrate, with pre- and postoperative treatment of surgical cases. Eusterman in an article on limitations of cholecystography points out that negative cholecystograms are the least reliable of signs and that false positives often occur in duodenal ulcer, in neurotic patients with achylia and in papilloma; that cholecystography is a test of function rather than of disease of the gallbladder. Rowntree presents a splendid paper on liver cirrhosis, containing all our latest knowledge of this much misunderstood disease.

These remarks concern only a few pages in the book which is replete with the most valuable scientific and practical matter to be found in any one publication on recent progress in clinical medichine and surgery. WINSLOW.

SYPHILIS. A Treatise on Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Prophylaxis and Treatment. By Henry H. Hazen, A.M., M.D., Professor of Dermatology and Syphilology, Medical Department, Howard University, etc. Second Edition. Cloth. 165 Illustrations. $10.00. C. V. Mosby Co., St. Louis. 1928.

The second is an improvement on the first edition of this valuable book. The chapters on occurrence and economic importance, syphilis of the nervous system, diagnosis and treatment have been entirely rewritten. The remaining chapters have been revised and a late bibliography added. The chapter on "The Economic Importance of Syphilis" should prove of interest to economists and saitariums as well as physicians, for the author quotes various authorities as follows: "Approximately 26,000 deaths in this country each year are caused by syphilis." "Estimated cash cost, to the country, of syphilis is over five billion dollars annually." "One hundred men dying in Massachusetts of luetic insanity, seventy-eight women and one hundred nine children were left to the care of society."

Contrary to the statistics of various German authorities and of Moore and Kemp of this country, the author's experience leads him to believe that the percentage of cures is much greater, if the early cases are allowed to develop natural immunity to the infection before vigorous treatment is instituted. "To know syphilis is to know the entire domain of medicine," so to comprehensibly cover in one comparatively small book the essential points of a subject, on which volumes have been written, is a difficult task which has been masterfully accomplished by the author. To the student who desires to obtain an understanding of syphilis, to the general practitioner or specialist who desires a handy reference or a hasty review, this book will be of great value.

JACOBSEN.

PRACTICAL CLINICAL PSYCHIATRY. By Edward A. Strecker, A.M., M.D., Professor of Mental and Nervous Diseases, Jefferson Medical College, etc. and Franklin G. Ebaugh, A.B., M.D., Professor of Psychiatry, University of Colorado Medical School, etc. Second Edition Enlarged and Revised, With Illustrations. 458 pp. $4.00. Blakiston's Son & Co., Philadelphia, 1928.

This book is primarily intended for students and practitioners. The authors have grouped the psychoses under three classes according to known etiology, organic psychoses, toxic psychoses, and functional (psychogenic) psychoses. This tends toward simplifying the problem which is usually made more or less confusing by detailed classifications found in most text-books. The charts and diagrams used to illustrate the text are good but for a book of this type there should be more illustrations. The case presentations are excellent. The chapter on psychoneuroses and neuroses gives but a fleeting glimpse of this great field. As a whole, however, the book is to be commended and should be of considerable value to the practitioner and student. WILT.

SPECIAL DENTAL PATHOLOGY. A Treatise for Students and for Practitioners of Dentistry and Medicine. By Julio Endleman, M.S., D.D.S., F.A.C.D., Professor of Special Dental Pathology and Therapeutics, College of Dentistry, University of Southern California, etc. Second Edition, with 371 illustrations, of which 318 are original, and 4 color plates. 444 pp. $7.00. The C. V. Mosby Company, St. Louis, 1927.

The author states it to be his aim to treat the subject from the standpoint of gross and microscopic pathology. To this is added clinical aspects of diseases discussed, since treatment is the ultimate purpose of the study of pathology. Normal histology is considered, followed by a consideration of the development of the teeth. Formation of teeth is presented with discussion of abnormalities in the number as well as absence of teeth.

Considerable space is devoted to dental caries with a summary of its predisposing causes. There are chapters on apical and other forms of abscess, pyorrhea and various diseases of the gums and oral

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mucous membranes. A profusion of illustrations illuminates the text in a satisfactory manner. One interested in this form of pathology will obtain much information from this volume.

Epidemic Encephalitis (Encephalo-myelitis). By Leo M. Crafts, B.L., M.D., formerly Dean and Professor of Nervous and Mental Diseases, Medical Department of Hamline University, Minneapolis, Minn. 237 pp. The Gorham Press, Boston, 1927.

In this volume the author presents the accepted knowledge to date of one of the most baffling and remarkable diseases treated in recent years. An interesting chapter reviews the history and definition of encephalitis. The uncertainty of the causative agent is discussed with a review of facts so far discovered. Under diagnosis differentiation is presented between this comparatively new disease and others with which it has been confused, such as meningitis, poliomyelitis, brain tumor, etc. Numerous case histories are reported, featuring many terminal conditions which every physician knows are so uncertain and the prognosis of which is indefinite. This is a very interesting and instructive volume and is worthy of perusal on the part of every physician.

The Surgical Clinics of North America (Issued serially, one number every other month). Volume 8, number 3 (Chicago Number—June 1928). 219 pages with 49 illustrations. Per Clinic year (February 1928 to December 1928), Paper $12.00, Cloth $16.00. Philadelphia and London: W. B. Saunders Company, 1928.

In this volume well known Chicago surgeons present clinical reports on subjects which interest all medical men and women. The surgical conditions of abdominal organs are especially featured, more than a dozen reports being presented of surgical treatment for varied abdominal pathology. The intestinal tract, bladder, kidney, gallbladder and ovaries are concerned in different surgical procedures. Surgical conditions in other organs are also considered but no attempt is herein offered to enter in detail into any of these clinical discussions. The volume is well worth the attention of all interested in surgery.

Present Status of Etiology of Epidemic Encephalitis. Josephine B. Neal, New York (*Journal A. M. A.*, July 28, 1928), presents for consideration three theories, of the etiology of epidemic encephalitis, which assume that: 1. It is a toxic disturbance of the central nervous system due to: (a) Toxins produced by organisms located probably in the respiratory or gastrointestinal tract. (b) Toxins elaborated as the result of metabolic disturbances. 2. It is caused by cultivable bacteria. 3. It is caused by filtrable virus. He says: The case for the toxic origin of epidemic encephalitis does not seem to rest on a very firm foundation. Many points of evidence, in regard to liver lesions, for example, are not corroborated by other workers or are differently interpreted by them. Moreover, the manner in which the disease spreads in increasing numbers from place to place and has since subsided strongly suggests that it is of an epidemic nature. In its epidemiologic manifestations it bears a strong resemblance to poliomyelitis and to meningococcus meningitis. Therefore, if one assumes that it is of a toxic nature, one is forced to hypothesize some infectious disease that was prevalent in different parts of the world for some years, to the effects of which epidemic encephalitis was due. In regard to the second theory, she points out that the pathologic changes in epidemic encephalitis do not suggest an inflammation due to bacterial action. The pathology of the brain in encephalitis, significant as it occasionally is, is not inconsistent with the presence of an invading agent, and—more than this—that it is indeed consistent with the assumption of the presence of a virus arousing the same general type of reaction as those of poliomyelitis or rabies. It is distinctly inconsistent, however, with the assumption of a bacterial process, and should have much weight in prejudicing us against the ready acceptance of a bacterial etiology of any of the various forms of cocci which have been described both for encephalitis and for poliomyelitis. A rather strong argument against the theory of the herpes-like virus being the cause of epidemic encephalitis is the fact that it is sometimes found in the spinal fluid of patients who are not suffering from the disease. The immense amount of experimental work done with these different viruses isolated from cases of epidemic encephalitis, and with strains of herpes virus, leaves little doubt that they are very closely allied, if not identical. The herpes virus is certainly not new. We have been familiar with it in a most innocuous role. We feel sure that, for many years prior to the recent outbreak, cases of the disease now known as epidemic encephalitis occurred rarely, if at all. It is a little difficult to picture the herpes virus suddenly developing such malignancy, and then quite as suddenly losing it, for certainly cases of acute epidemic encephalitis are now exceedingly rare.

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ORIGINAL CONTRIBUTIONS

EXPERIMENTAL STUDIES IN INTESTINAL OBSTRUCTION AND INTESTINAL TOXEMIAS *

Carl A. Dragstedt, Ph.D., M.D.
CHICAGO, ILL.

Of papers dealing with acute intestinal obstruction and allied types of toxemias there is no end. We have not, however, been solely traveling in a circle, for much that is of significance in an understanding of the normal physiology of the gastrointestinal tract and in the treatment of clinical conditions met with in ordinary practice has been born as a result of the numerous studies in this interesting field. I shall attempt here an analysis of the problem as it exists at present.

Complete obstruction to the passage of food through the gastrointestinal tract leads to adverse symptoms and death. There seems nothing remarkable about this, if one considers that the gastrointestinal tract, being the portal of entry for all of our nourishment, is thus prevented from performing this all important function. Starvation must inevitably result sooner or later from a complete obstruction, if the animal or man survives long enough. A closer analysis, however, demonstrates that the phenomena are not so simple and that there is a considerable variation in the degree to which complete obstruction provokes symptoms in different regions of the gastrointestinal tract.

By way of illustration, let us note, for example, the difference in consequences of obstruction in the esophagus and pylorus, if in both instances we attempt to circumvent starvation by operative procedures, permitting the access of food below the obstruction without relieving the obstruction. Esophageal obstruction is not an uncommon clinical condition. Gastrostomy here suffices, however, to maintain normal health. Jejunostomy is much less effective in pyloric obstruction.

It might be well, therefore, to discuss some of the general problems that have a bearing upon the varied types of gastrointestinal pathology met with.

1. Does any portion of the gastrointestinal tract have an essential function such that its extirpation is incompatible with life?

a. Stomach. Complete extirpation of the stomach has been accomplished in experimental animals and in man with complete success, providing a proper dietary regime is followed after the gastrectomy.

b. Duodenum. For a long time the effect of extirpation of the duodenum in the experimental animal has been in dispute. S. A. Mathews, for example, found that extirpation of the first six inches of the duodenum was invariably fatal. He contended that the duodenum was as essential to life

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as the adrenals or parathyroids, probably through some hormone function other than that concerned with in the elaboration of secretin. Similarly A. P. Mathews stated that, if experiments are made so that the duodenal juice is drained to the outside through a fistula, the animals die with apparently the symptoms of complete extirpation of the duodenum. He suggested that death may be due to the rapid excretion of some necessary substance through the duodenum to the exterior, or to the loss of some substance normally elaborated by the duodenum which is necessary to the function of the intestine lower down. In 1918, Dragstedt, L. R., Dragstedt, C. A., McClintock and Chase, first showed that duodenectomy in the dog was not incompatible with life. This was corroborated by Moorhead and Landis, and by Mann, who perfected better surgical methods and extended the experiments to many other species of animals.

c. Jejunum, ileum and colon. Numerous experimental and clinical observations have been made by many workers that definitely indicate that no portion of this part of the alimentary canal possesses any peculiar function other than that of digestion, absorption and excretion.

2. Is the presence of any of the gastrointestinal secretions necessary to life or necessary to prevent the development of acutely adverse symptoms?

This question with respect to gastric juice, pancreatic juice, bile and succus entericus can apparently be answered in the negative. Disturbances of digestion may appear in the absence of any of these secretions, some of which may be obviated by appropriate adjustment of the diet. Following total pancreatectomy, control of the diabetic symptoms with insulin may permit of life for considerable periods, although for permanent well-being oral administration of pancreas material seems to be essential. Following gastrectomy, duodenectomy, etc., the corresponding secretions are absent from the intestinal tract without serious symptoms becoming manifest.

3. Is the continued loss of any of the gastrointestinal secretions incompatible with life or directly productive of acutely adverse symptoms?

The answer to question 2 seems to be somewhat misleading. While the presence of a given secretion in the lumen of the gastrointestinal tract may not be essential to prevent the development of acutely adverse symptoms, it does not follow that the formation of this secretion with subsequent loss to the individual by either diversion to the exterior or failure of reabsorption is likewise relatively harmless. Numerous clinical and experimental observations are in accord that the total loss of bile through biliary fistulæ is not of serious consequence per se.

With regard to the consequence of loss of gastric juice the answer is not simple. MacCallum and his coworkers, and others who have studied the toxemia associated with pyloric obstruction, feel that the untoward symptoms and death are due to the loss of gastric juice by vomiting. Ivy, in the study of various questions of secretory and motor functions of the stomach, has prepared animals with a fistula or pouch of the entire stomach, anastomosing the duodenum to the esophagus, closing the cardiac end of the stomach and draining the pyloric end through the abdominal wall. Such animals, although continuing to secrete gastric juice which is lost to them, live indefinitely. It seems clear that the constant loss of gastric juice, secreted in basal amounts, is not of serious import. Such pouch stomachs have lost their vagus innervation, however, and perhaps do not secrete maximally and there is still some doubt as to the effect of total loss of gastric juice, if produced in large quantities. It has been shown by Ivy and others that pyloric obstruction is associated with excessive secretion on the part of the stomach and the loss of such excessive secretion may be of considerable significance.

The question of the consequences of loss of duodenal secretion or succus entericus was referred to in connection with extirpation of the duodenum. If intestinal fistulæ are prepared so that all of the bile and pancreatic juice are not simultaneously lost, and so that there is no obstruction to the fistulous opening, all of the best evidence seems to indicate that the loss of succus entericus from any level of the bowel is relatively without serious consequences.

The formation and loss of pancreatic juice, however, seems to present another story. Elman and McCaughan, on the basis of experimental work on the dog, concluded that the loss of pancreatic juice was rather rapidly fatal. Their animals died in six to eight days with symptoms of anorexia, gastric irritability, vomiting and asthenia. Symptoms frequently began on the third or fourth day. They were able to restore practically moribund animals by readmitting pancreatic juice to the gastrointestinal tract through the gallbladder.

There seems good reason to believe, therefore, that the loss of certain gastrointestinal secretions either by diversion to the outside, or perhaps by failure of resorption, may be a significant factor in the events that follow various types of obstruction pathology.

4. Is there a toxemia in any of the obstruction conditions?

Acute obstruction of the upper part of the small intestine leads to symptoms of a severe rapidly developing intoxication. There is an associated characteristic change in the blood chemistry. This may be summarized as follows: a decrease in the concentration of chlorides, a late increase in nonprotein and urea nitrogen and an increase in the carbon dioxid combining power of the blood plasma. It has been shown by Stone, Bernheim and Whipple, and later by Hartwell and his associates and by Murphy and Brooks, that the production of isolated closed loops of the intestine, with reestablishment of continuity around the isolated loop by anastomosis, produces symptoms similar to those following complete obstruction at the same level. There is likewise the same characteristic change in the blood chemistry. Minor differences as to degree of vomiting, etc. may be noted. On the whole, the conditions seem to be essentially parallel. Removal of such a closed loop either before or after the onset of the symptoms will either prevent or relieve such symptoms. This rather definitely shows that something is being absorbed from such a loop which may produce deleterious symptoms and indicates that a similar substance is being absorbed from a region of obstruction.

With regard to the possible nature of such a toxic substance or substances, there are a number of significant clinical and experimental observations that may be briefly summarized as follows:

a. Congenital atresia of the duodenum and other parts of the small intestine are not rare. Symptoms of toxemia, however, do not appear until after birth, when food and bacteria enter the alimentary tract. The secretions of the gastrointestinal glands begin early in intrauterine life and, if there is anything significant in obstruction alone in stimulating a toxic secretion, such toxemia should be manifest before birth.

b. The intraperitoneal injection into normal dogs of the fluid aspirated from closed loops of intestine produces a toxemia accompanied by the same characteristic change in the blood chemistry.

c. If isolated segments of the lower duodenum and upper jejunum are left open and permitted to drain freely into the abdominal cavity, many dogs will not develop peritonitis and will continue to live for long periods in good health. Such animals show no significant changes in the blood chemistry. It seems evident that the substances responsible for the toxemia are not present in the fresh secretion of the duodenal or jejunal mucosa.

d. After varying periods of from two weeks to two months, a second operation has revealed that these draining segments may become sterilized. When sterilization has occurred, such loops may be obstructed by closure of both ends without the development of the characteristic symptoms or blood findings. Such sterile loops may also undergo complete autolysis after complete ligation of the mesenteric blood supply without the development of adverse symptoms or the usual changes in the blood chemistry.

e. It is significant that histamine, which may be produced by the action of intestinal bacteria from histidine, has been found in the fluid of closed intestinal loops and in the obstructed intestine by both the method of biologic assay and chemical analysis, in amounts sufficient to account for an appreciable part of the toxicity of these fluids. Recent observations by Kendall indicate that free histamine base (which is the form in which it would exist in alkaline medium) is definitely effective via the intestinal mucosa. The subcutaneous injection of histamine in dogs produce symptoms of depression not unlike those following injection of obstruction fluids, a similar splanchic engorgement, a fall in blood chlorides and a rise in nonprotein and urea nitrogen.

5. What are the factors that make for absorption of these toxic substances?

In answer to this question there are a number of significant experimental observations. In 1919 it was shown that, if closed intestinal loops of the upper jejunum are made in the usual way but are washed with ether, alum, or tannic acid solutions prior to closure, approximately 50 per cent of the animals will survive. In these surviving animals it can be readily shown that the contents of the loop are not sterile and that they are toxic. It seems reasonable to interpret the action of these various chemicals on the basis of their astringent properties, or in so altering the secretion-absorption ratio in the loops that distention has been obviated. If a small amount of magnesium sulphate is introduced into such loops with resulting distention, adverse symptoms and death soon result. A somewhat more definite experiment has recently been done by

L. R. Dragstedt. After preparing a closed loop of the upper jejunum in the usual way and restoring intestinal continuity by end to end anastomosis, he fixed the closed loop to the anterior abdominal wall. This made it readily accessible for the withdrawal of its content by aspiration. Using the blood chemistry changes as previously mentioned as an index of the degree of toxemia, it could be readily shown that as the loop distended, untoward symptoms and blood changes occurred, to be promptly followed by recovery toward normal on aspirating a portion of the loop content. This could be repeatedly demonstrated on the same animal. Distention appears to operate by interference with the blood flow in the bowel wall.

The recent studies of Van Buren, Gatch and his coworkers and others point out the methods of this action. The latter workers showed a definite decrease in the blood flow from segments of intestine with corresponding increase of intraintestinal pressure. In some unpublished work in our laboratory we have confirmed and extended their observations. By a variety of methods we have been able to show that the duodenum is more and the colon less vulnerable, than the jejunum or ileum, to interference with a proper blood supply by changes in intraintestinal pressure. This is directly in harmony with the well recognized more rapid onset and greater severity of symptoms in obstruction of the duodenum as compared with obstruction lower down.

There is a not inconsiderable disparity of opinion as to the relative importance in any given type of obstruction condition of the various factors that we have mentioned. Dehydration, loss of chlorides (and it should be added, loss of other constituents of gastrointestinal secretions) whether by vomiting or failure of reabsorption, starvation and toxemia are in turn emphasized as the dominant factor. Investigators have reproduced obstruction syndromes, in which now one and then another of these have unquestionably occupied major importance. It seems not improbable, however, that all of them enter more or less into the average situation. It seems quite probable, for example, that the toxic substances which may play a role may in turn markedly augment the loss of gastrointestinal secretions, as it can be shown that they have a definite secretogogue action. Excessive secretion would in turn facilitate distention and consequent breakdown of the normal resistance to the intestinal mucosa against toxic material in the bowel lumen.

BIOCHEMISTRY AND GEOCHEMISTRY OF IODINE

WITH SPECIAL REFERENCE TO THE ETIOLOGY AND PROPHYLAXIS OF ENDEMIC GOITER *

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Since iodine was discovered by Courtois in 1811 the question of its occurrence and distribution in nature has been the subject of much research. If we study the older literature, we shall find that a number of scientists claim to have found it in the majority of materials examined. The French pharmacologist, A. Chatin, was especially interested in the question of the occurrence of iodine. In a number of works which were published about 1850 and onwards, he states the results of his investigations. He established and demonstrated the presence of iodine in plants and animals, and in air, water and soil. On the whole, he found this element everywhere, but in very small quantities. It appeared, therefore, that all the iodine in the world was distributed everywhere, and that thus it was only to be found in very small concentrations.

I must not omit to mention another French scientist, A. Gautier, who about 1900 published the results of his investigations on the occurrence of iodine in sea and air. Through him we find also the first mention of its occurrence in igneous rocks. He was the first who with certainty demonstrated and established this fact.

Contemporary scientists doubted the correctness of Chatin's investigations and a committee, appointed by "Academie des Sciences," in Paris, to verify his results, could only in part confirm their correctness on account of the defective analytic methods at their disposal. Later investigations of the occurrence of iodine, however, showed that Chatin's results were quite correct. The Swiss scientist, Th. von Fellenberg, also investigated the whole of nature organic and inorganic, and in agreement with Chatin was everywhere able to demonstrate and determine quantitatively the occurrence of iodine in small quantities. We had, in fact, discovered an element that was apparently spread abroad in all directions.

The impression we get of the occurrence and distribution of iodine from these authors is thus almost as follows: Iodine seems to occur everywhere, in rocks, in the sea, in the air and in all

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organisms. But no conformity to law in regard to its occurrence and distribution was demonstrated.

We note specially that it is always present in organisms. There is also comparatively more in plants than in animals. Whence comes this iodine in organisms? Where was it before the birth of organic life, when the earth was still a floating mass? In other words, it is the history of iodine that we wish to clarify.

The questions regarding the history of elements and the laws affecting their distribution on earth are the subjects with which the new modern branch of science, geochemistry, is concerned. The first object is to find out the laws for the distribution of the elements on the solidification of the earth. This branch of geochemistry has been specially worked out by V. M. Goldschmidt, Oslo, Norway, and H. S. Washington, U. S. A. As the earth cooled and organic life began, a whole range of elements were drawn into the organic world. Such elements as chiefly build up organisms are carbon, hydrogen, oxygen, nitrogen and a number of others, but also the great majority of the other elements are regularly found in greater or lesser quantities, as component parts of organisms. The branch of geochemistry, which specially includes the history of the elements in the organic circulation, we can call bigeochemistry and this has been particularly worked out by the Russian scientist, W. Vernadsky.

We shall now first discuss a little the geochemistry of iodine, its history and its laws of distribution. I here follow the views propounded by Goldschmidt as to the geochemical distribution of the elements, according to which the chemical components of the earth, on solidifying, divided themselves, according to affinity and specific weight, into several concentric shells or phases. The innermost is a core, consisting of metallic iron; outside this a sulphide-phase, chiefly consisting of ferrous sulphide and, outside of all, a silicate molten mass, whose outermost layer forms the crust of the earth. Besides these fluid phases we had a steam-phase that now forms the atmosphere and the hydrosphere. I cannot here go further into these interesting matters, but they have been published by Goldschmidt in a series of papers in "Skrifter utgitt av Videnskapsakademiet" in Oslo. He has sought to find distribution laws for the chemical elements, and he has characterized those which are found concentrated in the iron kernel as siderophile, those that are concentrated in the sulphide shell as chalcophile, and those that are concentrated in the silicate mass as lithophile, and finally he called the elements that are present in the steam-phase, the atmophile.

In which of these phases was the iodine or the main portion of the iodine at the time of the earth's original separation into phases? In order to answer this question it was necessary to examine the various phases as to their iodine-content.

That we today find iodine in the air and in the sea, that is, in the atmosphere and in the hydrosphere, is no proof that there was iodine in the original steam-phase. It may have come there later on.

We shall subsequently see, though, that we have been able in another manner to give a positive answer to this question. We note in the meantime that iodine is found in the atmosphere, and that, therefore, according to Goldschmidt's nomenclature, it shows atmophile characteristics.

The next question will be, does iodine occur also in the other phases, for instance in the silicate mass, the lithosphere? In order to answer this, von Fellenberg of Bern and I have together conducted a series of experiments to determine the iodine content of igneous rocks. The result of these investigations is, in short, the following: Iodine could be demonstrated and quantitatively determined in all the igneous rocks examined. I cannot here go further into the methods used in determining these small quantities, but will only refer to previous publications.

The quantity we find is about 0.2-0.3 mg. per kg. All igneous rocks appear to contain the same quantity, or at any rate quantities of the same order. Nor can we find any difference in the iodine content in the more basic and the more acid rocks. In table 1 I have grouped some figures that illustrate this.

TABLE 1

IODINE-CONTENT OF IGNEOUS ROCKS AND MINERALS

	Iodine in mg. per kg.
ROCKS	
Granite, Fredrikshald	0.20
Larvicite, Larvik	0.30
Labradorite, Ekersund	0.23
Obsidian, Island	0.32
Basalt, Daltenberg, Siebengebirge	0.31
MINERALS	
Marble, Carrara	0.55
Marble, Velfjord, Nordland	0.07
Titanite, Blaafjell, Ekersund	0.77
Hypersthene, Soggendal, Ekersund Territory	0.94
Labradorite, Soggendal, Ekersund Territory	0.44
Biotite, Kragero	0.50
Hornblende, Kragero	0.16
Scapolite, Risor	0.23
Sodalite, Brevik	0.90
Phlogopite, Bamle, Oedegaarden	0.63

Apatite, yellow, Bamle, Oedegaarden	0.18
Perthitic-microcline, Halvorsroed, Raade, Oestfold	0.37
Albite, Halvorsroed, Raade, Oestfold	0.15
Muscovite, Halvorsroed, Raade, Oestfold	0.69
Fluorspar, Halvorsroed, Raade, Oestfold	0.55
Smoky Quartz, Halvorsroed, Raade, Oestfold	0.33

It might now be of interest to know if the iodine content in the rocks was united to a certain mineral or if it was evenly divided over the whole mass. In order to investigate this, a number of rock-forming minerals were examined as to their iodine content, and we find it noteworthy that all minerals, with some few exceptions, contain more iodine per kilogram than the rocks (see table 1). This fact is, however, easily explained. For these investigations only large crystals were used, and these were probably all of them from pegmatitic veins. In the residual liquor of the magmatic differentiation, out of which the pegmatitic minerals are crystallized, the easily soluble compounds are enriched, and as the alkali iodides belong to these easily soluble salts, we can expect to find an enrichment of iodine just in these minerals. The iodine has not, however, preferred any special mineral, if we except the fact that we find in mica minerals a fairly constant quantity of 0.6-0.7 mg. iodine per kilogram. A number of minerals containing chlorine were examined, as it might be supposed that the iodine accompanied the other halogens, but this proved not to be the case. Some of the minerals were tested also as to their bromine content but the proportion between bromine and iodine content was variable and without any distinct conformity to law.

That iodine, besides its atmophile tendencies, has also a litophile character is thus confirmed, but we know nothing as yet of the laws relating to its distribution among the various minerals. In order to test whether iodine, besides its atmophile and litophile characteristics, also is capable of appearing in the other phases, von Fellenberg, at the suggestion of Goldschmidt, tested some magmatic sulphides as to their iodine content. These also are iodine-bearing but they contain still less quantities than the silicates. We arrive, therefore, at the interesting result that iodine displays also certain chalcophile tendencies.

But we may ask, when iodine is found in all these three phases, why then is it not to be found also in the iron core of the earth? At first it appears quite out of the question that iodine should be found in some form or other dissolved in the iron, but our investigations have proved that this really is the case. If iodine is found in the earth's core, it must in some way or other be soluble in iron, and as it is found in all materials that are used in iron smelting works, we might expect to find it in all technical iron. In the smelting of iron, coke is used, an article which is particularly rich in iodine, and an admixture of lime, which is also generally rich in it. All the conditions favorable to such a result are thus present.

Following up this idea, von Fellenberg and I set to work to test a number of sorts of technical iron and steel as to their iodine content. We examined in all twenty-six different specimens and found in all of them iodine varying from 0.1 up to 1.1 mg. iodine per kilogram of iron. We found, however, no relation between the iodine content and the chemical composition of the iron. The quantity of iodine present in the iron is only dependent on its content in the materials used in the working of it. It was now proved that iodine is a constant associate of all iron, but still it was not proved that it appears in the earth's iron core, though our investigations showed that it was very probable.

A proof of the siderophile character of iodine was, however, forthcoming, when von Fellenberg succeeded in determining it in iron meteorites. The iodine content in the iron meteorites tested varied from 0.14 mg. to 1.5 mg. per kilogram. As we must assume that meteorites come from heavenly bodies that have approximately the same chemical composition as our own planet, we may take it for granted that iodine must also be found in the earth's iron phase and thus also is siderophile.

Regarding the concentration of iodine in the earth's iron core, however, we still know nothing. The meteorites examined give, of course, an indication of the order of size, but we can come to no certain conclusion. On the original division of the earth into phases iodine must have been distributed between the various molten masses according to its affinity to every single one of them, and there must be found a proportion for this distribution, conformable to a fixed law. This proportion von Fellenberg endeavored to obtain by testing the proportion between iodine concentration in the two different phases in a so-called compound meteorite, which contains both iron and a solidified silicate molten mass separated from this. In the case of a compound meteorite from Bomba there was found a distribution quotient between silicate and iron of 100 : 15. There was, however, as von Fellenberg personally has informed me, so little material for such a test that these figures cannot form any basis for broader conclusions.

Accordingly I endeavored to find the distribution quotient in another manner. We have seen that iodine is found in all varieties of technical iron. It is, therefore, natural to suppose that it must also occur in the slag formed in iron smelting. In the technical blast furnaces we find both the fluid iron mass and the fluid silicate slag present at the same time, and the iodine will be distributed according to its affinity between the two fluid phases. The distribution quotient between iron and silicate molten mass can thus be found direct.

To investigate, in pursuance of this idea, I started an investigation of blast furnace slags and iron, with the object of determining their iodine content. So as to be able to make a direct comparison with the crust of the earth the slags were analysed.

TABLE 2

	Iodine in mg. per kg.		
	Slag	*Iron*	*Proportion*
A	0.80	0.32	100:40
B	0.85	0.32	100:59
C	0.60	0.43	100:72

Table 2 shows the iodine content of the slags and the iron. We see that the proportion is about 100 : 50 or 2 : 1. The composition of these slags is, however, not identical with the composition of the earth's crust, nor with that of any existing rocks. In the first place these blast furnace slags (A and B) do not contain alkalis; likewise their calcium content in proportion to magnesium is generally greater than in rocks. They are also more basic than th eaverage composition of all igneous rocks. Therefore, we tested a cupola furnace slag (C) and the cast iron obtained from it at the same time. This slag is considerably richer in silic acid, and here we find the proportion somewhat displaced in favor of the iodine content of the iron. The order of magnitude is, however, the same, and as we know that the iodine content of silica rocks is 0.2-0.3 mg. per kilogram, we can place the iodine content of the iron core at 0.1-0.15 mg. per kilogram.

Our studies in connection with the blast furnace process made another matter clear for us. In the dust which was found left in the flue the iodine was enriched many times, compared with the content in the slag and in the raw materials used. From this we may conclude that the iodine escaped in its elementary form during the process and was caught by the particles of dust in the flue. Von Fellenberg had also previously found a strong concentration of iodine in fireplace soot and also in cement dust. We have thus the direct proofs also of the atmophile character of iodine. We can sum up the results arrived at in the following law regarding the geochemical distribution of iodine: *Iodine is an element, as far as we hitherto know the only one which on the earth's division into phases did not show remarkable affinity to any of the phases. It became part of them all, but showed, however, more conspicuous atmophile and lithophile than chalcophile and siderophile characteristics.*

Besides the four inorganic phases into which Goldschmidt divides the earth in his geochemical survey, we have still a fifth one, the biosphere. The biosphere is bounded by the atmosphere and the hydrosphere on the one side, and the rocks on the other, and is the seat of all the organic life on earth. As I have already mentioned, it was Vernadsky in particular who urged the importance of the biosphere in all geochemical surveys.

When an element enters into organisms and is thus drawn into the biosphere, its geochemical history is changed in an essential degree. Iodine is in this case specially interesting because the concentrations in which most often we find it in the biosphere are greater than in the rocks. A concentration of iodine must, therefore, have taken place in the biosphere. Iodine has, so to speak, been pursued by organisms.

When the earth cooled, the first steam atmosphere was condensed and became the hydrosphere and an atmosphere which contained less moisture. Disintegration of the rocks took place, and in consequence part of the iodine which was found in the rocks was released. The greater part of the iodine of the disintegrating rocks accompanies them when they become soil. Plants take their iodine from the soils, animals get theirs by feeding on plants. Figure 1 shows the iodine's circulation in nature. Plants and animals on decaying set free their iodine again. But plants do not exclusively obtain theirs from the soil; according to von Fellenberg, they also absorb iodine direct from the atmosphere; they "inhale" iodine. When they decay, a good deal of the iodine set free escapes again into the air. During certain processes some iodine is set free from the soil and escapes into the atmosphere. The atmosphere returns it to the soil again; the iodine falls to the earth dissolved in rainwater. Also snow, hail, rime, etc., contain iodine. Plants are always richer in iodine than animals.

A part of the iodine which is set free by disintegration is carried away by surface water. Fresh water algæ absorb great quantities and are considerably richer in iodine than land plants. Fresh water fish, again, get their iodine from these algæ.

The iodine which is not captured by organisms is carried by the surface water into rivers and thus into the sea. The sea has obtained its iodine-content partly in this way, and partly from the first steam atmosphere which surrounded the earth. The iodine concentration in the sea is considerably greater than in fresh water. Many scientists have fixed this at about 0.02 mg. per litre. Marine algæ are, therefore, also richer in iodine than fresh water plants and for the same reason marine animals are also richer in it than land animals and fresh water ones.

Figure 1 shows how plants obtain iodine from the sea, sea animals again from plants. On the decay of organisms a part of the iodine is again set free, but large quantities are withdrawn from the organic circulation and pass over into sediments. In later geologic periods these sediments may be forced up above the sea level, may again be exposed to disintegration and the iodine be set free. It will then be drawn into the biosphere, and we have the iodine circulation completed. In these remarks regarding the circulation of iodine I have chiefly confined myself to publications by von Fellenberg and myself, but I must not fail to call attention to important papers by McClendon on the iodine content in various fresh waters in the U. S. A., and weighty investigations of the iodine content of various foodstuffs from goiterous and nongoiterous regions in the U. S. A.

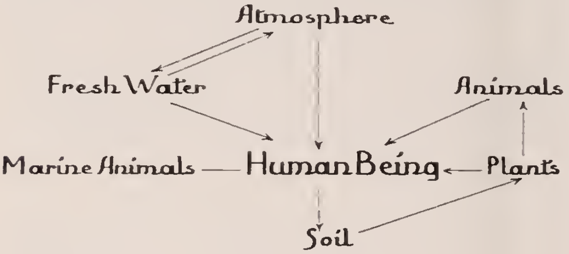

Fig. 1. Circulation of iodine in nature.

As previously mentioned, the quantity of iodine found in marine organisms is much greater than that which can be traced in land plants and in land animals.

During the last year I have made a special study of the iodine content in marine organisms, for the purpose of making clear the circulation of iodine in the sea. As far as the iodine content in sea organisms is concerned, if we omit the determinations governing it in marine algæ, we have only some older investigations on fishes by the French scientist Bourcet, as well as more recent investigations by D. K. Tressler and A. W. Wells of the U. S. Bureau of Fisheries in Washington, D. C.

In cooperation with Helmer Haaland and Sigurd Opstad Madsen some representatives of the commonest Norwegian teleosts were first examined. The result is to be found in table 3.

TABLE 3

AVERAGE IODINE-CONTENT OF FLESH OF NORWEGIAN TELEOSTS

	Iodine in mg. per kg.	
	Fresh (moist)	*Water-free*
Haddock (Gadus aeglifinus)	7.65	34.17
Cod (Gadus morrhua)	4.89	22.20
Coal-fish (Gadus virens)	2.65	13.37
Ling (Molva molva)	4.80	23.16
Cusk, torsk (Brosmius brosme)	3.60	17.85
Plaice (Pleunorectus platessa)	0.71	3.61
Red-fish (Sebastes marinus)	1.41	6.60

Compared with the figures found for these species by Bourcet, Tressler and Wells, our own are much higher. It is, therefore, probable that the iodine content is dependent on the location of the fishing grounds. The specimens examined by us were caught in February, 1928, at Moere on the west coast of Norway.

The great difference in iodine content in the three species examined made it appear probable that the iodine content of the fish depended on the character of its food. We know that haddock (gadus aeglifinus) is a fish that chiefly feeds on the invertebrates of the bottom fauna. Coal fish (gadus virens) feeds to great extent on zooplankton, and hunts small fish in the upper layers of the water, whilst cod (gadus morrhua) may be said to take an intermediary position between the other two. In collaboration with Karl Closs and Madsen I examined some typical specimens of the bottom fauna, and in accordance with our theory we found also here large quantities of iodine.

TABLE 4

IODINE-CONTENT OF INVERTEBRATES OF THE BOTTOM FAUNA

	Iodine-content in mg. per kg. (moist substance)
Metazoa, Actinia	1.14
Vermes, Ascidians	33.02
Echinodermata, Asterias	1.12
Culcita pentangularis	13.10
Holothurian	0.97
Holothurian	3.30
Arthropoda, Crustacea, Pandalus borealis (shrimp)	5.11

Table 4 contains our results for the invertebrates examined. In order to get a complete picture of the cycle of iodine in the sea, it was first necessary to examine the plankton. The lower types of sea animals and a great number of fish derive their chief supply of food from plankton.

In cooperation with Closs I examined a large supply of phytoplankton, chiefly consisting of diatoms taken from the Oslo Fjord in March. The moist plankton contained 38.09 mg. of iodine per kilogram, or 230.91 mg. per kilogram water-free substance, that is, not only a larger quantity than in all other organisms previously investigated, but also of a quite different order of magnitude. The iodine content determined is of a like order of magnitude as the iodine content in the various species of sea-weed (fucus, laminaria).

The plankton is thus able to concentrate the marine iodine. The iodine content of the ocean is about 0.02 mg. per litre. Various scientists have arrived at various values; the quantity appears also to vary greatly with the locality, but the order of magnitude is always the same. According to von Fellenberg's investigations up to 25 per cent of this iodine is united to insoluble filtrable particles (plankton). It is clear that these figures must vary considerably, as the production of plankton for many reasons may be very great or very small. We see, however, that iodine is about 10,000 times as concentrated in water-free plankton as in the sea. This gives a good idea of the extent to which plankton is capable of concentrating iodine. I have also investigated samples of zooplankton, which were likewise extremely rich in iodine. Larger quantities were determined than in any of the specimens of ocean fauna hitherto examined.

On the basis of the investigations which we now have at our disposal, we can form an idea of the circulation of iodine in the sea, or in other words the iodine metabolism of the sea, roughly as follows (fig. 2). The iodine that is released from weathered rocks is carried by the rivers out to sea. Here it is absorbed by the plankton just like other nutritive salts from the land (especially phosphorus and calcium compounds). The production of plankton is periodical and depends on the Norwegian coast chiefly on the supply of nutriments from land. It is especially rich during the melting of snow in spring. At that time the great quantities of iodine, which have been released by the erosion of rocks in the course of the winter, are carried more or less suddenly out into the sea. During and immediately after the flowering of plankton in the upper layers of the ocean, only a very small quantity of it is utilized as food for the lower or higher species of animals (especially zooplankton). The great mass sinks to the bottom, and some of this plankton serves there as food for the invertebrates of the bottom fauna. The bottom fishes, as we have seen before, obtain their iodine mostly from these animals. On the decay of the various plants and animals a part of the iodine is, as mentioned before, once more set free and can then be absorbed anew by plants. But large quantities are withdrawn from the circulation by the fact that they sink to the bottom with the remains of plants and animals and pass over into the sediments.

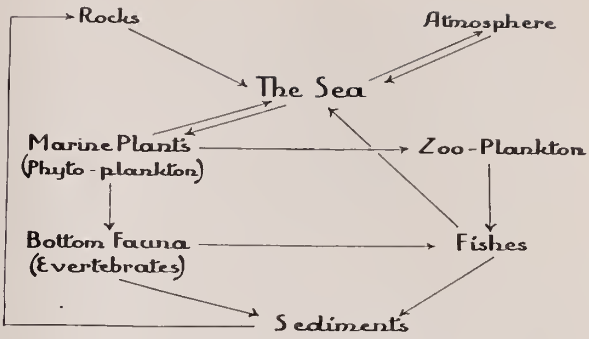

Fig. 2. Circulation of iodine in the sea.

There is also a constant reciprocal action between the surface of the sea and the atmosphere. According to von Fellenberg, iodine is set free at the surface by certain processes; it escapes and passes over into the atmosphere. It is carried back into the sea again by precipitation. As the concentration of iodine in the sea is so much higher than in fresh water, it is clear that sea-air will be considerably richer in iodine than inland air. And this fact is of no little importance for both men and animals in districts along the sea-coast. For experiments have shown a higher concentration of iodine in the surrounding nature and, therefore, in all organisms in coastal districts compared with corresponding inland organisms.

(To be Concluded)

ETIOLOGY AND TREATMENT OF CHRONIC ARTHRITIS. The relatively high morbidity incidence of chronic arthritis, the progressive chronic course and the incapacitating nature of the disease make the economic aspect a very important one. Willard C. Stoner, Cleveland (*Journal A. M. A.*, Aug. 25, 1928), believes that the conception of the etiology indicates that there are two distinct types, the one infectious, the so-called hypertrophic form, and the other, the metabolic type, the so-called atrophic form. These forms are not always definitely distinct and one may fuse into the other. Etiologic treatment is largely limited to the infectious or toxic nature of the disease. Dietary measures have limited value. The results of careful management of these cases as described warrants the application of the measures mentioned as a routine. The treatment of these cases should not be left in the hands of the quacks and faddists.

MALFUNCTIONS OF THE THYROID GLAND

THE BASIC PRINCIPLES UNDERLYING THEIR MODERN TREATMENT

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Part II.

CHEMISTRY OF THE THYROID GLAND

The average iodine content of the thyroid is .09 per cent.[1] Marine states "In our experience a thyroid that has less than .1 per cent of iodine cannot be normal anatomically, and a thyroid that has continuously had an iodine store above .1 per cent cannot be abnormal anatomically."[2] Other mammalian tissue never contains more than .001 per cent of iodine. In vertebrates the thyroid alone is important and an iodine-containing tissue and iodine is the only halogen present in marked amounts in the thyroid. The colloid of the thyroid contains varying amounts of iodine.[1] So far as is known, iodine is the only chemical element peculiar to the thyroid. The thyroid gland transposes the molecules of iodine from the compounds of iodine that enter the gland into the iodine of thyroxin.[3]

In 1895, Bauman produced the substance called "thyroidin" by boiling and so decomposing thyroid tissue in sulphuric acid. From this an alcohol extract was obtained, which was called thyroidin. This substance was inconstant and less active than desiccated thyroid.

Oswald, in 1899, by repeatedly extracting thyroid tissue with normal saline and from this extract salting out by semisaturation with ammonium sulphate, produced a product called by him iodo-thyro-globulin. While this closely resembled desiccated thyroid in action, it was not a definite chemical compound.[1]

Kendall separated thyroxin as a pure chemical compound in 1914.[4] He further perfected his process and announced the structural formula for the product in 1919. This formula, he stated as a 4-5-6-trihydro 4-5-6-tri-iodo 2 oxybeta-indol proprionic acid[5]. He thought that it occurred in four forms, each being easily converted into the other forms. From 6,500 pounds of fresh thyroid tissue, he obtained 33 grams of thyroxin. The thyroxin contained 65 per cent iodine. Thyroxin is conceded to be the substance, or at least one of the important substances, through which the thyroid exerts its control on metabolism.

Harington, of London, though recognizing thyroxin as an active principle of thyroid secretion, found the evidence in support of Kendall's proposed formula to be insufficient. In 1925, he made a synthetic preparation closely agreeing in composition with the formula deduced by Kendall. This showed no physiologic action resembling that of thyroxin. Harington set about to devise a less laborious and less wasteful method of preparing thyroxin. This he accomplished, obtaining a yield of thyroxin of .27 per cent, as against Kendall's .0011 per cent. His purified product yielded 65.3 per cent iodine.

Harington's analysis of his own product found the nitrogen to be lower than Kendall had reported in his formula, making the empirical formula of the Harington product $C_{15}H_{11}O_4NI_4$, as against Kendall's $C_{11}H_{10}O_3NI_3$. On comparing Kendall's product, as manufactured by Squibb, with his own, Harington found the properties of the products to be identical.[6]

Upon the basis of his revised formula, Harington[6] removed the iodine from his thyroxin by reduction, obtaining a compound of the formula, $C_{15}H_{15}O_4N$, each atom of iodine being replaced by an atom of hydrogen. This compound he called desiodo-thyroxin (deiodized thyroxin). In this way a stable compound was obtained for experimental purposes. Harington then synthetized his desiodo-thyroxin and identified the natural and synthetic product as the same, both differing from thyroxin only in that 4 atoms of iodine in their formulas were substituted by 4 atoms of hydrogen.[7]

The iodine compounds obtained from the thyroid previous to Kendall's thyroxin were impure, unstable and inconstant. Kendall was never able to synthesize thyroxin because his formula was in error. Harington checked and corrected this error in the chemical formula and with this correction was able to synthesize the chemical, giving promise of a cheaper product. He perfected a method whereby 24.54 times as much thyroxin can be obtained from the same amount of thyroid tissue.

Thyroxin accounts for approximately 25 per cent of the iodine of the thyroid, the remaining 75 per cent being other compounds of iodine, some of which may not yet have been converted and some of which may be included in unknown active principles. The physiologic activity of thyroxin is identical with that of desiccated thyroid. One mg. of thyroxin given to a 150 pound adult raises the basal metabolic rate 2 per cent. Thyroxin is unchanged by the digestive tract. The identification of thyroxin is an important step in the unraveling of the mystery of the function of the thyroid by giving a therapeutic and experimental agent, from which definite quantitative results may be obtained. To date the expense of thyroxin prohibits its use as a therapeutic agent, other than in experimental work. Desiccated thyroid is sufficiently standardized for ordinary therapeutic requirements.

PATHOLOGIC PHYSIOLOGY OF THE THYROID

Iodine has been used in the treatment of diseases of the thyroid ever since it has been known that the thyroid contained it (more than 1700 years). Used promiscuously, some cases would recover, others would be benefited, some would show no benefits and some would be distinctly made worse.

As a result of the development of surgical technic by Kocher and others, resection of a portion of the thyroid was found to give better results (even with its mortality which, compared with the mortality of today, was high) than the promiscuous administration of iodine.

Because of his diverse activities, it will be hard for anyone to ever fully appreciate the manifold contributions of C. H. Mayo to the goiter problem. By his own operative effort our present standard operation was evolved, for in spite of slight variations in technic the operation of thyroidectomy, wherever it is done in appreciable quantities, resembles in principle the technic established by Mayo. He aroused the interest of clinicians and laboratorians and with his moral and financial stimulation, directly and indirectly, our present day conception of diseases of the thyroid gland has developed.

Today the malfunctioning thyroid can be governed at will, provided the patient is kept under proper control. The two great mortality-reducing donations of H. S. Plummer are, first, the dual product theory of thyroid secretion; and, second, the recognition that the thyroid heart is not a diseased but an overworked heart, and that digitalis is contraindicated except in very rare instances. The crucial realizations of Plummer have really done more than any other factors in reducing the mortality of thyroidectomy.

The cause of the stimulation which starts thyroid malfunction is unknown. Among its contributing causes are unaccustomed or long-continued mental and physical strain, calling for increased metabolism and consequently for increased thyroxin output.

Plummer and his associates have estimated that the amount of thyroxin in the tissues of the average normal adult is 14 mg., that the thyroid delivers approximately .33 mg. of thyroxin daily, and that in individuals whose basal metabolic rate is near the normal, 1 mg. of thyroxin elevates the basal metabolism 2.8 per cent. He considers the known function of the thyroid to be to maintain 14 mg. of thyroxin in the body, or to elaborate and deliver .33 mg. daily, and believes that, when the thyroid content of the body goes below the approximate 14 mg., the thyroid is stimulated to discharge thyroxin. In hypofunctioning thyroid disease the administration of sufficient thyroxin to maintain 14 mg. in the body will place the thyroid at rest.[4]

In attempting to express the relation existing between the various types of goiter confusion will be eliminated by allowing the reader's imagination to draw upon itself for the conditions existing where the types seem to merge. There is a great contra-indication of terms in the description of the histologic pathology of the thyroid. For that reason, definitions of the words as used in this article will be given here.

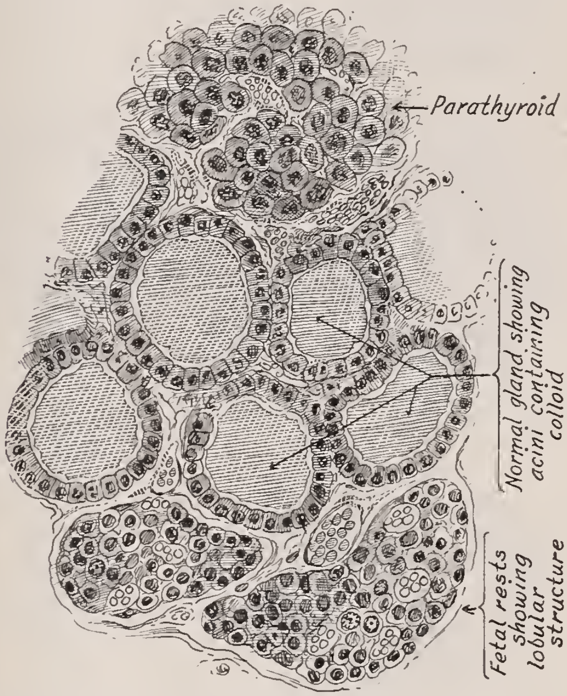
Parathyroid
Normal gland showing acini containing colloid
Fetal rests showing lobular structure

Fig. 9. Composite diagram illustrating the normal histology of the thyroid gland.

The terms "acinus" and "vesicle" are used synonymously as applying to the individual, epithelial-lined secreting unit of the thyroid (fig. 9).

Hypertrophy is used as opposed to atrophy. Its use indicates the lengthening and enlarging of the epithelial cells of the vesicles from low cuboidal to high cuboidal or columnar cells, in an attempt by nature to bring them to their highest production. Hypertrophy is not used to mean an increase in the number of cells of the vesicle (fig. 10, D).

By hyperplasia is meant an increase in the number of epthelial cells lining the vesicle. Hyperplasia does not take place in a vesicle distended with colloid, but begins to occur after the diminution of the normal colloid within the vesicle, when the vesicle begins to take on a wrinkled or crumpled appearance (fig. 10, B).

Atrophy expresses that change from a functioning organ to scar tissue, brought about by fatigue, pressure, or the physiologic absence of the necessity for the existence of the cells as functioning units, as the atrophy of senility, the atrophy following the return of an overactive gland to normal condition, occurring in those cells whose presence has become superfluous, and the atrophy following castration. Scar tissue may be the final stage of atrophy, may follow inflammatory conditions, may come during the absorption of hemorrhage or may occur as the final stage in areas that have been cut off from their blood supply.

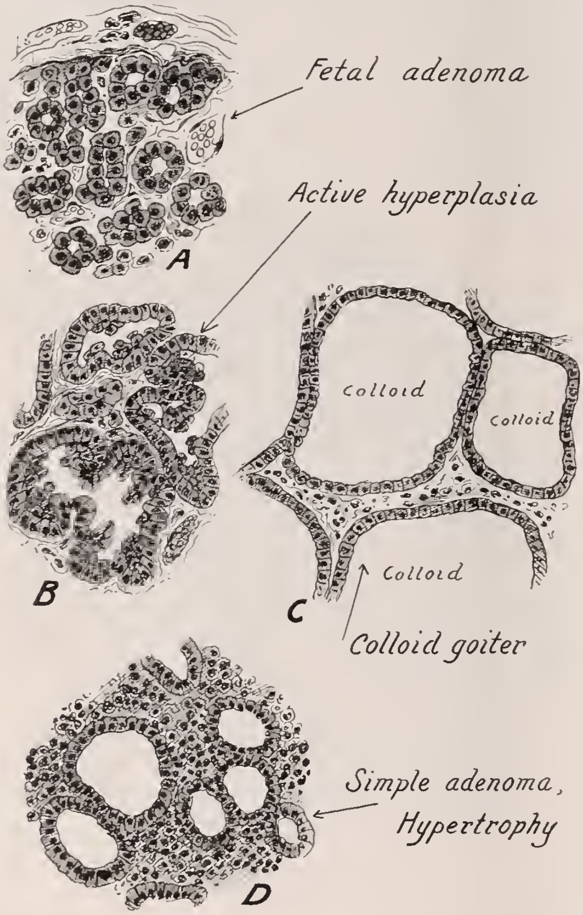

Fig. 10. Diagramatic illustration of the four pure types of thyroid pathology.

A. Fetal adenoma. An unsuccessful attempt of immature fetal cells (rest cells) to form themselves into secreting units.

B. Active hyperplasia as found in the hyperplastic or exophthalmic goiter.

C. Colloid goiter. Acini distended, cells at rest.

D. Simple adenoma. A somewhat successful attempt of rest cells to form themselves into secreting units.

Degeneration refers to actual necrosis which occurs in adenomas that have distended until their centers are beyond the reach of their blood supply. Hemorrhages may be brought about by high blood pressure, sudden strain or necrosis. Cysts may occur in the center of adenomas which have been expanded beyond their blood supply or in the cavities left by hemorrhages. Calcification frequently follows upon the scar tissue formed during the absorption of hemorrhage.

The term "colloid" is applied to that chemically colloidal substance which inhabits the center of normal and resting vesicles of the thyroid gland and which functions as a vehicle for storing thyroxin, the active principle of the thyroid gland, and which passes into general circulation, as all colloidal substances pass, by means of the lymphatic system. The blood vascular system is impenetrable to colloidal substances.

The term "adenoma" is applied to those nodular enlargements within the gland, considered by some to be produced by stimulation of the thyroid rest cells and by others, more recently, as a hyperinvolution occurring during the return of the hyperplastic thyroid to normal. Neither theory of origin has any particular bearing upon thyroid therapy.

Exophthalmic goiter, or hyperplastic goiter, applies to that state of hyperfunction of the thyroid, manifested pathologically by diffuse hyperplasia of the gland, differing from the adenomatous type clinically by having in addition to the symptoms of hyperthyroidism shown by the adenomata certain eye and nervous symptoms which have been thought by Wilson to be due to damage of the sympathetic nervous system[8] (fig. 10, B).

The secretion of the thyroid vesicles is considered as being through the cells lining the vesicles, the cells having a bipolar action. They produce both thyroxin and colloid. During times of great activity they produce thyroxin in solution which is secreted toward their external periphery and is absorbed by the venous system surrounding the vesicles. During their resting period they produce colloid together with thyroxin, which is secreted centrally into the vesicle, where it is stored until a demand is made upon the vesicle for thyroxin, when the colloid containing this thyroxin passes through the walls of the vesicle, perhaps through the cells themselves or perhaps around them, to the lymph vessels surrounding the vesicle, by which it is absorbed into the lymph system. Sudden demands upon the vesicle are probably supplied from the colloid within its center until the gland begins to increase its function.

We shall assume that a normal thyroid receives a stimulation greater than it can accommodate. The first reaction is the pouring out of the thyroxin-containing colloid into the lymphatics. The low cuboidal epithelial lining cells then hypertrophy, the vesicle becomes distended with colloid, and thyroxin is poured by the cells peripherally into the blood stream. The thyroxin poured into the system stimulates the basal metabolic rate, which in turn calls for more thyroxin. The colloid from the center of the vesicle is drawn upon; it diminishes and weakens; vacuolets appear around the edge of the colloidal space; the epithelial lining cells pass from the high cuboidal to columnar; the walls begin to crumple; more thyroxin is liberated; there is more increase in the rate of metabolism, more call for thyroxin (fig. 11).

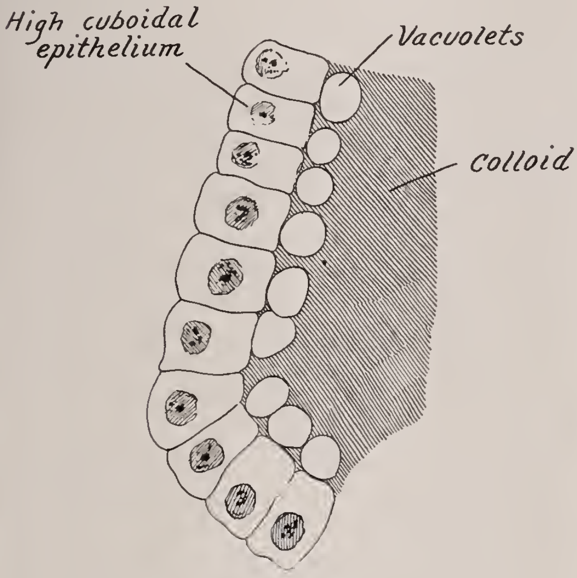

Fig. 11. Shows section of acinis in which the cells are hypertrophied (columnar), and colloid is diminishing as shown by the vacuolets. (From Cowdry).

Then hypertrophy ends and hyperplasia commences. Additional epithelial cells appear in the lining of the vesicle. The vesicle is too busy to maintain the production of colloid; the vesicular walls infold; what colloid remains in their centers is thin, pale and limpid; the cells in the lining of the vesicle rapidly increase in size and number; this is hyperplasia (fig. 10, B). More thyroxin is poured into the blood stream; there is a further increase in the basal metabolic rate, and more call for thyroxin (fig. 9).

Considering adenomas from the standpoint of the thyroid rest theory, if the development of the thyroid rests is sufficient and if they are called into action, the cells group themselves into acinar formations and produce fairly normal vesicles in glandular order, surrounded by a fibrous capsule, developed from the fibers that surrounded the clump of rest cells and inflammation. The capsule may be very thin during the early activity of the gland, or later by scar formation may become very thick. This is the simple adenoma of pure hyperthyroidism. If the cells in the rest gland are not sufficiently developed and are still embryonic in type, they make feeble, inefficient attempts to form acini. They may fail to form themselves into acini or they may produce immature acini. This is the fetal adenoma (fig. 10A). The fetal adenomata are usually surrounded by a very stable capsule which may be inflammatory from a previous attempt of nature to expel a foreign body.

After repeated stimulation of adenomas the encapsulated masses expand and their centers grow beyond reach of their blood supply. Necrosis takes place, followed by hemorrhage, cyst formation and perhaps calcification.

At any time during this process the thyroxin production may catch up with the demand, in which case vesicles begin to fill with colloid and become distended; the columnar cells become high cuboidal and then cuboidal and the gland comes back to rest, showing evidence of its previous activity as increased cells in the membrane of the vesicle, irregularities in borders of the vesicles and increased stroma or fibrous tissue between the vesicles.

The adenomatous formations remain, become filled with colloid and inactive. So the gland remains until it is stimulated to repeat the same course, which may come at any time or may never come.

As a rule, after such a course of activity of the gland, the basal metabolic rate becomes subnormal. The cells of the vesicles which have somewhat resumed their normal proportions are more numerous than before and have less work to do. The vesicles, as if upon defense, fill with colloidal material against another assault. This is the colloid goiter, represented by distended vesicles, irregular in size, with cuboidal epithelial lining (fig. 10, C). The patient's basal metabolic rate is below normal, though never extremely so. By increasing the basal metabolic rate to normal by the use of thyroid extract and iodine, the colloid is absorbed and the enlargement of the gland disappears.

Exophthalmic goiter is the goiter of diffuse hyperplasia. This disease, formerly so serious, has been reduced to the status of the simple adenomatous goiter by the dual product theory of Plummer. This is that the gland so excessively stimulated produces an excess of good and a portion of bad thyroid secretion, incomplete in that it lacks iodine, and that the toxicity of the bad thyroid secretion is responsible for the additional symptoms manifested by the exophthalmic goiter. Plummer has found that by treating these patients with Lugol's solution or soluble iodine, the lacking element in the bad secretion is supplied, thereby changing the symptomatic picture from that of exopthalmic goiter to that of simple hyperthyroidism and doing away with the type of toxicity produced by the bad secretion. Exophthalmic goiter may be a syndrome of hyperthyroidism plus fatigue, the fatigue being brought about by the futile attempt of the gland to develop a completed thyroid product.

As can be readily seen, exacerbation may recur time and time again. The adenomatous goiter, after increased activity, becomes inactive but retains its form, and the cell formations, always present, persist over a period of many years, when for some reason they may become stimulated to activity again. Iodine and thyroid extract have been thought to produce this stimulation. These adenomatous types possess the characteristic of lawless activity upon being aroused. The activity may go on for but a short time or it may continue over a long period. This activity, once started, does not stop when the demands of the body for thyroid secretion are fulfilled and so it becomes lawless.

To recapitulate, the pathologic changes involved in the incidence of goiter are:

1. Hypertrophy, a change of the epithelial lining of the vesicles from low cuboidal to high cuboidal cells, followed by an increase in colloid, then a decrease in colloid and a lengthening of the cells from high cuboidal to columnar.

2. Hyperplasia, an increase in the number of cells in the vesicular lining and a further decrease in the colloid content, resulting in a crumpling and infolding of the walls of the vesicles. The pure hyperplastic goiter is not associated with adenoma formation.

The types of goiter as here considered are:

1. Adenomatous, manifested by hypertrophy and hyperplasia in nodular formation. They are of two types: Simple adenomatous, with fair semblance of vesical formation, which produce excess thyroxin when active; and fetal adenomatous, with poor semblance of vesical formation, which are not functioning units as a rule, though the types may merge. The fetal adenomas are prone to malignant changes.

2. Exophthalmic, or hyperplastic, producing both good and bad secretion and differing from the adenomatous goiter clinically in that it imposes upon the vascular symptoms of the adenomatous type the trophic, nervous and eye symptoms of the exophthalmic type. According to Plummer, the hyperplastic or exophthalmic thyroid secretes both a good and a bad product. The good product is a bad secretion plus iodine and, conversely, the bad product is a deiodized good secretion.

3. Colloid goiter, the resting stage of a gland that has previously been active. The vesicles are filled with colloid, as if in defense against a sudden assault. Colloid goiters return to normal upon the basal metabolic rate being brought to normal with thyroid extract and iodine. Plummer has never seen a colloid goiter with a basal metabolic rate below minus 18.[4]

Cretinism is that clinical picture produced by a congenital deficiency of thyroid tissue. The basal metabolic rate is low. Unless of long standing, the condition may be cleared up by bringing the basal metabolic rate to normal, by the use of thyroid extract and iodine.

Myxedema is the acquired syndrome in which there is a marked deficiency of the thyroid secretion. It may be brought on by exhaustion atrophy of the gland or by thyroiditis, but more commonly is the result of too great operative resection. The basal metabolic rate in myxedema is below minus 28.[4] The condition may be cleared up by bringing the basal metabolic rate to normal with thyroid extract and iodine.

These last three conditions may all require treatment indefinitely. The thyroid extract should be given for a time, then Lugol's solution, and if the condition returns thyroid extract should be resumed.

The pathologic hyperactivity of adenomatous goiters usually takes place ten to fifteen years after the activity which first enlarged the nodule. Hyperactive adenomatous goiter is rare before thirty years of age. When suspected colloid goiters do not disappear following the treatment with iodine and thyroid extract, and nodules remain, they are probably adenomatous in nature. There is no medical treatment that does adenomatous goiters any good whatsoever, and, if active, they should be removed as soon as their type is determined. The hyperthyroidism will immediately disappear. The rate may then go below normal, in which case thyroid extract should be given for a time following the operation.

Exophthalmic or hyperplastic goiters should receive iodine treatment until the basal metabolic rate will no longer drop, the pulse remains stationary and the patient is beginning to pick up in general health, when the gland should be removed. There is no reason for ligating the superior thyroid arteries or for hot water injections. The administration of iodine turns the bad into a good product and gives the clinical syndrome of simple hyperthyroidism. As can be readily seen, many combinations and variations of these conditions may exist.

Recently Rienhoff and Lewis[9] have advanced a theory, in which they consider the adenomatous or nodular goiter to be produced by a hyperinvolution or overcorrection of the pathologic process in the return of a hyperplastic goiter to normalcy, following rest or iodine therapy. This discredits the thyroid rest theory. However, it does not account for the marked difference in the two types of symptoms, namely, adenomatous and exophthalmic, nor for the difference in response to iodine therapy. As interesting as this may be from a pathologic standpoint, it has no bearing upon the treatment of goiter and still has to withstand the controversy of pathologists.

The application of the principles described in this paper has been found sufficiently ample to cope with nearly all goiter cases satisfactorily. The few exceptions will be considered in a later paper.

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TUBERCULOSIS OF THE INTESTINE

AN APPARENTLY PRIMARY CASE *

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That primary intestinal tuberculosis may occur and that resection of any part of the intestinal tract may be imperative, while operating under a diagnosis of appendicitis, are the compelling reasons for offering a clinical presentation of a case that, it is hoped, may institute discussion on the two phases of the subject herein included.

Experts on tuberculosis are chary to accept the idea that tuberculosis of the intestine ever occurs as a primary condition. Even in those cases of proved intestinal tuberculosis, relieved by operation but without any clinical or laboratory evidence of pulmonary tuberculosis, the experts contend "it proves nothing." They further state that "in cases of the so-called primary intestinal tuberculosis of the intestine coming to autopsy, whereupon the pathologist has reported the lung to be free from tuberculosis, the autopsy was carelessly performed and an expert would have found a primary tuberculous condition in the lung."

Blumberg,[1] at the last meeting of the American Society of Clinical Pathologists, stated: "Intestinal tuberculosis may be a primary condition in children. It occasionally happens that intestinal manifestations make themselves known in adults before the pulmonary tuberculosis infection is recognized. Whether such manifestations represent *primary intestinal tuberculosis or are merely the result of tuberculotoxic influences is still a matter to be proved.*

"It is assumed that intestinal tuberculosis is the result of the successful deposit and multiplication of the tubercle bacillus within the intestinal wall. The organism is carried to this place from an existing focus either by means of the lymphatics or the blood vessels, or perhaps most often through the alimentary canal by means of swallowed sputum. In children food containing tubercle bacilli may also be responsible."

Tendeloo (quoted by Blumberg) contends that "* * * certain factors are responsible for the favorable deposit of the organisms in the intestines. These factors are: An empty stomach or empty intestine will allow the passing through the mucosa of the bacillus with greater readiness than an alimentary canal which is not empty. Certain types of vehicles may serve the tubercle bacillus, as for instance, milk which carries the organisms and allows their deposition upon the intestine with great readiness."

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* From the Surgical Division of the Sweet Clinic.
* Read before Lewis County Medical Society, Chehalis, Wash., May 14, 1928.

The researches of Bezredka, Calmette and Guerin, of the Pasteur Institute of Paris, which have led to the vaccination of infants against tuberculosis, being administered orally within a period of a few days and before the child is fifteen days old, is worthy of profound attention. The results of vaccination of infants by these men, which is based upon a new and revolutionary principle of immunity, have shown uniformly favorable results in a large series of cases in Greece, Switzerland, Belgium and France.

Patients with pulmonary tuberculosis may have had their primary infection in the intestine and not, as is generally believed, in the lung. Later information from the Pasteur Institute may definitely settle this question.

Brown and Sampson[2] have reviewed the literature concerning the frequency of primary intestinal tuberculosis: "Primary intestinal tuberculosis has proved to be very rare. Since the separation of the bovine and human types of tubercle bacilli, much work has been done and figures collected to show the prevalence of primary intestinal tuberculosis. It is supposed to be more common in children, and Heller found it ten times in 85 autopsies in children and again six times in 28 similar cases. Bonome, in 4224 autopsies (performed between 1889 and 1906) found 126 cases of primary intestinal tuberculosis in 769 cases of tuberculosis. Bidert found it sixteen times in 3104 cases of tuberculosis, and at the Munich Pathologic Institute it occurred once in 1000 cases. Bovarid, in 1841 collected cases, found 150 with primary intestinal tuberculosis. He calls attention to the fact that the English have many, the Americans few cases of primary intestinal tuberculosis.

"In series of 22,725 autopsies, collected by Gant, and including many of the foregoing figures, primary intestinal tuberculosis was said to be present in 7.22 per cent. One case occurred in our experience with adults. Mummery has never seen a case of primary tuberculosis of the colon.

"In 100 cases of hyperplastic tuberculosis of the colon the disease was primary in 76, secondary to pulmonary tuberculosis in 18 per cent. It is of interest to note that Weber and Tante found bovine tubercle bacilli in 25 out of 28 cases of primary intestinal tuberculosis."

However, it is the opinion of Dretzka[3] that "tuberculosis is the most frequent cause of inflammatory affections of the bowel. Tuberculous lesions are rarest in the duodenum, becoming more frequent as one nears the ileocecal valve. The surgical importance of ulcerative tuberculosis, in which extensive ulceration has been present, lies in the fact that healing is followed by scar contraction. Intestinal obstruction may result, and is treated in the regular manner. The tuberculous condition is unrecognized until symptoms of obstruction present themselves. During the operative procedure the entire intestinal tract is systematically examined by beginning at the cecum and tracing its course, and following the small bowel down from the jejunum."

It is said that "strictures resulting from tuberculous or enteric ulceration are usually situated in the ileum" (Oxford Surg., Vol. 2, 838, 1919).

Blumberg[1] calls our attention to the fact that at operation it is often impossible to decide, from an examination of the outside of the intestine, just how extensive must be the resection so that all pathologic tissue will be removed. He states: "We were never able to recognize small lesions from the outside. It is important to bear this in mind. Surgical removal of ulcerated lesions may promise a certain amount of benefit to the patient, especially when threatened with a stenosis, but the removal of such visible ulcers does not insure the removal of the ulcers nearby, too small to be seen.

"We have seen at necropsy ulcers of the cecum and small intestine which were visible upon external inspection of the intestine. They were of such a kind that even the best surgical judgment and the most conservative opinion would favorably consider operative interference with the hope of their complete eradication. Upon inspecting the open intestine, however, it was found that numerous small lesions existed as far up as the jejunum."

Heretofore it has been maintained that tuberculous ulcers of the intestine always present themselves as encircling the bowel. On this point Blumberg remarks that "the manner of fusion of these lesions will act to a great extent in deciding whether the resulting ulcer will take a course along the intestinal folds or across them. The most frequent ulcer met with is the one encircling the mucosa of the intestine. The longitudinal was present in 3 per cent of our cases. Therefore, tuberculous ulceration of the intestine cannot be ruled out entirely, whenever an ulceration of the intestine occupies a longitudinal position. Perforation is a comparatively rare occurrence, considering the frequency with which ulceration of the intestine takes place. We had only three cases."

Charrier[4] has recently reviewed the subject of ileocecal tuberculosis in an exhaustive communication. He summarized that "The onset of ileocecal tuberculosis may be marked by enteralgia, enteritis, occlusion or perforation. The first named is by far the most frequent. The disease may be of the hypertrophic, the ulcerocaseous or the localized form. If occult blood and tubercle bacilli are found in the stools, radiologic examination revealing ileac stasis with dilatation and presence of opaque fluid six, eight or ten hours after the meal, emptiness of the cecum and a part of the ascending colon, and colic hyperkinesia support a diagnosis of ileocecal tuberculosis. Clinically, the diagnosis is often difficult at the beginning, before the appearance of the tumor. The only treatment is surgical. Exeresis may be performed in one or in two stages. This permanently cures tuberculosis in from 30 to 40 per cent of the cases."

That tuberculous ulceration (of the ileocecal region of the intestine) has frequently been diagnosed as appendicitis has been the experience of most clinicians who have had experience in such cases.

Brown and Sampson,[2] in their book on intestinal tuberculosis, have given us a complete analysis of the results of surgical treatment in these cases and concluded: "From our experience, we are led to agree with Professor Archibald that the safest surgical measure at present is to bring each end of the affected loop or portion of the bowel out through the abdominal wall, making in this way two mucous fistulae, and anastomose the remaining normal loops.

"The intestinal contents would by this method pass over no diseased portion of the bowel. If the disease is very localized and the patient in good shape and can stand it, excision is by far the best method but never free from danger."

They believe that it is impossible to make a diagnosis of tuberculous enteritis from clinical symptoms. Charrier[4] supports the above contention. The roentgen-ray method of diagnosis, according to the technic standardized by Brown and Sampson, is the only means by which a diagnosis of intestinal tuberculosis may be made.

Brown and Sampson remark: "In support of the presence of a localized hypermotility in the diseased area, Alvarez states in his comprehensive articles on gradients in the intestinal tract, that there is a higher gradient at the diseased site and that there is an upgrade or retardation immediately proximal to the diseased area, and a downgrade or acceleration immediately distal to it. This hypothesis may often explain physiologically the empty, diseased cecum, with ileal stasis often present, and the general hypermotility occurring beyond.

"If the peak of this altered gradient is very high, the diarrhea, so frequent in tuberculous ulceration, is partially explained, and conversely, as the ulceration heals the peak is flattened, the diarrhea is lessened and in many instances disappears. The process of the flattening of this peak is very often demonstrated by serial roentgenographic examinations."

The fact that there is a retrograde flow or antiperistalsis in the proximal colon, a phenomenon that has been demonstrated by Canon and later confirmed by Case and others, and the fact that the barium meal is constantly and rapidly hurried through the cecum or ascending colon in tuberculous colitis, emphasize further the value of interpreting correctly pathologic hypermotility, considering we know that movement is normally more or less continuous after the meal passes the middle of the transverse colon, and that a portion of the barium column may move uninterruptedly from the hepatic flexure to the sigmoid, possibly leaving behind it a thread-like or irregular outline, simulating defective filling. The interpretation of "pathologic hypermotility" or filling defect in this region has to be very guarded.

In consequence of the hypertonic contraction or spasm of the ulcerated part, there is produced a marked irregularity in the outline of the barium shadow which has been referred to as a "filling-defect." This is only the result of hyperfunction of this portion of the colon and usually differs materially from the filling-defect caused by a hyperplastic type of tuberculosis or by malignant growths, where there is usually a partial obliteration of the lumen and often a very decided and permanent defect in the wall of the gut.

In a number of cases an ileal stasis of more than six hours at the sphincter has been demonstrated. When such a stasis is observed before any barium has entered the cecum, it is reasonable proof of a real stasis. However, after it has entered the cecum, it is reasonable proof of a real stasis.

After the ascending colon is partially filled and the stomach has been empty for some hours, the interpretation of an ileal stasis may be complicated by the phenomenon described by Case, "a regurgitation of the cecal contents into the ileum which, while keeping the terminal loops of the ileum filled, may not be a true ileal stasis."

Brown and Sampson recommend the "two-meal technic" in roentgen-ray examination to determine ileal lesions.

Blumberg[1], in presenting the pathology of intestinal tuberculosis, gives the following summary:

1. Intestinal tuberculosis is a frequent occurrence. It is usually secondary to a far advanced, active tuberculous infection of the pulmonary tissues.

2. Ulceration appears only after certain changes in the cells which, as a result of part of complete devitalization, allow successful deposit and multiplication of the tubercle bacillus.

3. Early lesions may not be responsible for clinical manifestations as complained of by the patient. In fact, such complaints may not be associated with intestinal tuberculosis, or there may be no complaint whatsoever at the time the lesions make their appearance.

4. The early dyspeptic manifestations do not represent the symptoms of intestinal tuberculosis. It is during the stage of spasticity and peritoneal irritation that symptoms arise, resulting from tuberculous intestinal infection.

5. The ulcers are first small and circular; later they are large and of irregular outline. They may follow the course of the mucous fold and form the encircling ulcer. They may traverse a number of folds and then represent the longitudinal ulcer.

6. Perforation is not frequent, as there is a tendency towards thickening of the floor of the ulcer.

7. In the cecum and colon there may be either individual lesions or extensive diffuse tuberculosis, with thickening of the entire wall of these organs.

8. Bleeding occurs at some time during the course of the ulceration.

9. Diarrhea, due to tuberculosis, is not always a result of lesions in the colon, neither is constipation always a result of ulceration in the small intestine.

10. The finding of tubercle bacilli in the stool rarely, if ever, confirms the existence of intestinal tuberculosis.

11. The gross character of the stool should be studied when tuberculosis is suspected. The nonfermentative pasty, alcoholic, viscous stool, especially the one containing occult blood, should be looked upon with suspicion, as it may point toward tuberculous intestinal infection. The findings must agree with the clinical findings and the patient's history of active tuberculosis.

12. There is no known clinical laboratory test by means of which a diagnosis of intestinal tuberculosis can be made.

I desire in presenting this case to show, first, the difficulty of diagnosis; second, and above all, that any surgeon, who begins an operation with the idea that a simple appendectomy may be easily carried out, may be constrained to perform excision of the bowel for conditions simulating the symptoms of appendicitis.

A Japanese male, age 25 years, came complaining of pain and tenderness over his appendix. He had been to see his family physician who told him he had appendicitis.

His present illness began about one month ago with general abdominal distress, associated with nausea without vomiting and loss of appetite. He told us that food had been so repellant for days that he has not been able to bear the sight or smell of it. He had eaten almost nothing for two days. About fifteen or sixteen days previously the pain became localized in the right lower quadrant of the abdomen, and for the past week he stated he has been able to feel a lump in the region of the appendix which he thinks is increasing in size. He declares the lump is not very tender, but is more so than it was a week ago. His general condition is about the same as it was a month ago, except for the abdominal tenderness and mass.

He has gradually lost weight for a period of over a year and is now twenty-five pounds under weight. He attributes this to his loss of appetite. He has been working as a car loader, which is heavy labor, in a lumber yard until two weeks ago. He quit work, but did not feel sick enough to go to bed on account of this illness, although he has been lounging around. He has no respiratory, cardiac or renal symptoms. He was constipated until a few days ago, when he began to have some diarrhea, but that has now improved. His family physician yesterday advised him to see us.

Physical examination: The patient is a fairly well developed young man of average appearance, except he is somewhat taller than the average Japanese. He is thin but not emaciated. His general physical examination is negative, except for the localized tenderness over McBurney's point and the small distinct fixed, readily palpable, tender mass in the same region. His urine examination is negative, as is also his blood Wassermann. His white cell count is 12,000. The stool examination is negative. The case seems clearly to be subacute appendicitis with probably a localized abscess.

Diagnosis: There are at least five conditions which must be considered in this case aside from appendicitis.

1. Carcinoma of the cecum. This was considered and was eliminated because of the young man's age. He is but twenty-five years old. We did not do a colon ray after an opaque enema. His acute symptoms pointed too definitely to appendicitis.

2. Intussusception. In this condition a tumor mass appears in this region and may be intermittent in character. The mass here, however, is fixed, tender and permanent. In intussusception the mass is not tender and is movable.

3. Tuberculosis of the cecum. Primary tuberculosis of the bowel is rare. This young man's lungs are negative as to physical findings and also the x-ray. We show here a radiogram of his lungs which was taken the night he came to us and it is negative (fig. 1). There has been no blood in the stool but it was not examined for tubercle bacillus.

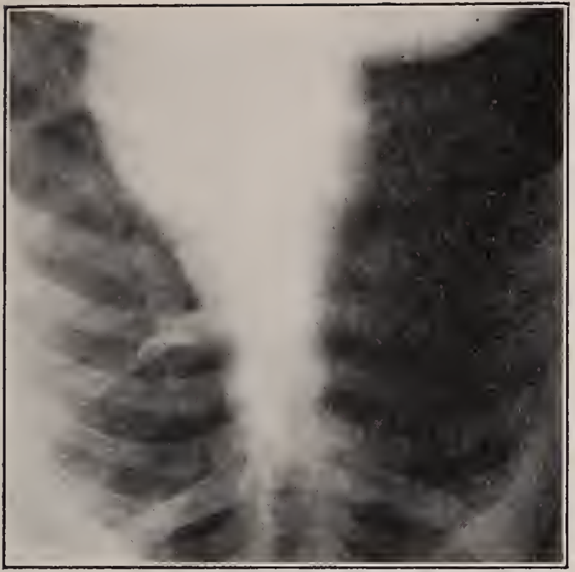

Fig. 1. Radiogram of chest, showing no tuberculous involvement.

4. On one occasion, when I was assisting Dr. Chas. Mayo with an operation, he ran across a condition in the region of the appendix which proved to be a large amount of fibrotic tissue, in the center of which was a small amount of low grade almost dried up necrotic tissue, which he styled a "woody abscess." I have this picture before my mind while viewing this case.

5. Incomplete rotation and absence of fusion of the cecum and ascending colon with Jackson's or Lowe's membranes.

Operation: I am making a right rectus incision in this case and as I open the abdomen it is seen at once that this is not a case of appendicitis. It is either malignant or tuberculous. The small bowel, slightly adherent to the mass, is readily freed. The omentum completely envelops the mass and I have now cut away the outer sheath of the mesocolon and am able to lift the entire mass out of the abdomen. There is no glandular involvement which I can find. I have examined along the spine, mesentery and liver and find no enlarged glands. I believe the whole ascending colon should be removed and possibly five or six inches of the small bowel.

This small bowel, which was adherent to the mass, does not seem to be involved. I shall do nothing with it. It may seem as though I am removing more bowel than necessary, but I would rather err on the safe side of removing too much than too little. This strong Payr's clamp, which I am using on this large bowel, when used in connection with the actual cautery makes the removal of this large mass comparatively safe, as my technic thus far has been aseptic.

I have now removed this entire mass and have not as yet soiled the field. I will do end-to-side anastomosis, and will insert the small bowel about three inches from the invaginated end of the large bowel. I am securing this to the outer parietal wall of the abdomen and will place a piece of rubber dam, cut from an old rubber glove, between this mass and the bowels. He has a small amount of omentum left and I will place it next this rubber drain and tack it securely with three or four interrupted sutures to hold it in place. The wound is closed with one rubber tissue drain.

Aftertreatment: The head of the bed was elevated twelve inches and a hypodermoclysis started. A pint of saline was given per rectum by the Murphy drip every three hours. Morphine, gr. 1/6, was administered every six hours for four days. Nothing was given by mouth for two days. The lips were kept moist with cold water. Liquids were begun the third day and the patient took solid food on the seventh day. He made an uneventful recovery.

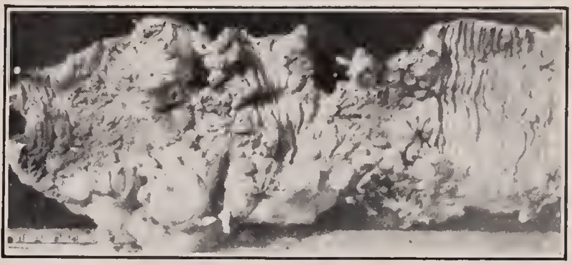

Fig. 2. Photograph of gross specimen 31 cm. long by 15 cm. wide. The affected areas show circular and longitudinal invasion.

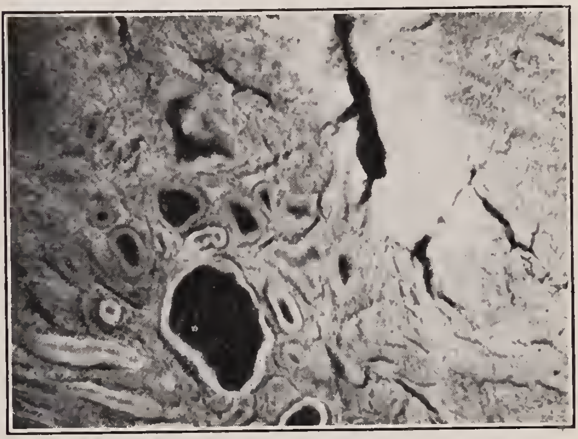

Fig. 3. Caseated area in the same field with intestinal mucosa.

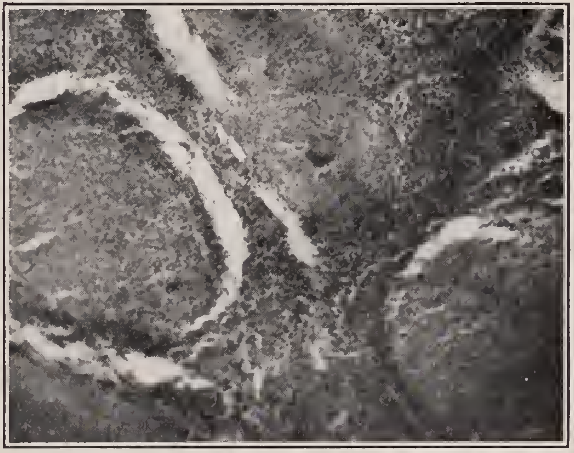

Fig. 4. Areas of caseation, showing giant cell formation.

Laboratory report. The specimen consists of 10 cm. of the ileum, the cecum and 36 cm. of the large bowel. There are ulcers involving the mucosa, submucous and muscular coats which extend longitudinally along the large bowel for a distance of 21 cm. One of these ulcerated areas completely encircles the bowel. There is much thickening of the wall in the region of the ulcers (fig. 2).

Microscopally there is much round cell infiltration with complete destruction of the mucosa. Areas of caseation with giant cells in abundance throughout (figs. 3 and 4).

Diagnosis, tuberculosis of the large bowel.

The patient has been under observation since the operation. His recovery has been complete and improvement in his general health has been continuous. After three months he returned to work at his regular job of heavy labor. His appetite has been ravenous. He has gained thirty pounds in weight. Recent examinations of his lungs, including radiography, are negative.

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ETIOLOGY OF CARCINOMA

WITH CANCER STATISTICS FROM SWEDISH HOSPITAL*

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Since this paper is entitled carcinoma, it is justifiable to discuss our views as to the etiology of cancer. Gross descriptions of these various abnormal growths date back to as early as 2000 B.C., appearing in the cuneiform tablets of the library of Ninevah, which were written approximately 1500 B.C. The literature of the middle ages is filled with fallacious descriptions of these growths, as is typified by the writings of Hippocrates and Galen.

Up to this time their appearance in an individual was associated with spirtual growth, either good or bad. The first accurate knowledge of tumors of interest to pathology came with the works of Virchow, who was the first man to study cellular growth, and to inquire into the nature of these abnormal tissues. He early recognized the fact that all tumors are not of the same character and his classification into histioid, organoid and teratoid tumors stands today as one of the most intelligent classifications for a working basis of tumor diagnosis.

Zeit, of Northwestern University, added to that classification the typical and atypical forms of cells. This completes a simple working classification which one does well to keep in mind whenever examining a tumor growth, either macroscopically or microscopically.

While on the question of classification, I will state that every man who has long studied tumors arrives at his own classification which he uses in his diagnosis of tumors and which in the ultimate analysis fits into the Virchow-Zeit classification in so far as fundamental histologic findings are concerned. In the unessential details one need but consult one or two of the modern textbooks to see how greatly these individual classifications vary in their interpretation of certain tumor growths.

The following arrangement is one of convenience and represents the Borst classification somewhat modified. It follows in some particulars that of Ewing. It serves as a guide both to classification and nomenclature. Any classification at the present time is emphatically one of convenience and cannot be regarded as final. As in all fields of pathology, a system based on cause is the only one which will have both practical and academic value. Until the etiology of tumors is determined and elaborated, no classification can be regarded as fully satisfactory.

A. The connective tissue tumors.
  I. Connective tissue as a type.
    1. Fibroma, fibrous connective tissue.
    2. Chondroma, cartilage.
    3. Osteoma, bone.
    4. Myxoma, mucoid tissue (like Wharton's jelly).
    5. Lipoma, fat.
    6. Angioma, vessels.
      a. Hemangioma, blood vessels.
      b. Lymphangioma, lymphatic vessels.
    7. Lymphoma, lymphoid tissue.
    8. Chordoma, notochord.
  II. Muscle as a type.
    1. Leiomyoma, smooth muscle.
    2. Rhabdomyoma, striated muscle.
  III. Elements of the nervous system as a type.
    1. Glioma or neuroglioma, neuroglia.
    2. Neuroepithelioma, neuroepithelium.
    3. Neuroma, nerve fibers and cells.
  IV. Endothelium as a type.
    1. Endothelioma, endothelium.
      a. Angioendothelioma.
  V. Sarcoma, malignant connective tissue tumors.
    1. Immature forms, of more or less undifferentiated cell.
    2. Mature forms, malignant tumor with differentiated parts like any of the benign forms mentioned above.
B. The epithelial tumors.
  I. Papilloma, of surface type of epithelium upon a supporting connective tissue.
  II. Adenoma, glandular epithelium upon a supporting connective tissue.
  III. Epithelioma — epithelium usually of surface type, in atypical arrangement.
  IV. Cylindrical cell carcinoma, cylindrical epithelium from glands or surfaces, in atypical arrangement.
C. Mixed tumors.
  I. Simple mixed tumors, made up of more than one type of tumor tissue, arbitrarily including monodermal, e.g., osteochondroma, and bidermal, e.g., mixed tumors of parotid and of kidney.
  II. Teratoma, made up of tissus differentiated to represent three layers of embryo, and therefore tridermal.

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*Read before King County Medical Society, Seattle, Wash., Jan. 16, 1928.

What is the etiology of any tumor growth? The answer is, "We do not know." As to the theoretical hypotheses which have been presented, we need to consider Cohnheim's theory which considers any abnormal growth of tissue as arising from an embryologic rest cell. This may be a so-called unicentric, a multicentric or a polycentric cell, depending upon the state of development at the time nature overlooked this cell and allowed it to remain dormant.

The teratomatous tumor seems to be explained by Cohnheim's theory. However, practically all other types of tumor, with the possible exception of the so-called hypernephroma, are not explained by this theory.

The history of cancer is filled with instances of so-called cancer houses, rivers and districts. However, close study of these has failed to impress one with any evidence of their authenticity.

You are all well acquainted with the various and sundry theories and authorities who have claimed to have isolated an organism which is the causative factor in cancer. You have all seen these various etiologic organisms advocated by their discoverers presented to the medical profession for consideration and then die a natural death. Why? Because they are not the causative factors in cancer.

The theory of local irritation cannot be passed by in discussing cancer formation. You have as an example of this theory, workers in coal derivatives. You are familiar with the fact that these people in this industry are very prone to develop malignant tumors of the squamous cell type. A given group of one thousand such people will develop three or four times the number of epithelial tumors as a like group in some other profession. There are many other instances to illustrate this theory which I will not enumerate.

We have also included in this theory of local irritation those organs which have intermittent physiologic function. By this we mean that those organs which normally are active and then inactive are more prone to develop cancer than are organs which are physiologically continuously active. To illustrate, one needs but mention the mammary glands and uterus.

This theory also explains why we have carcinoma in the intestintal tract at the points which offer resistance to the flow of the food in the process of digestion and elimination, as illustrated by the pyloric end of the stomach, the proximal end of the cecum, the sigmoid and the rectum.

The consideration of heredity in cancer has been foremost in the thoughts of many pathologists at various periods in the study of these tumors. Ten years ago the weight of opinion was decidedly against heredity playing any important part in the production of tumors. However, the presence of so-called cancer families caused a number of men to investigate this point. Warthim reported several families, in which the development of tumors was approximately twenty-five per cent greater than in a like number of people in similar circumstances.

The discussion of heredity and its relation to the production of tumors led Maude Slye to begin her study of this problem in the McCormick Institute in Chicago thirteen years ago. At the present time she has studied approximately 60,000 mice and has apparently established the fact that the Mendelian law is applicable to tumor formation in a given strain of mice.

The results of her studies have been widely published and read. Ewing summarizes her results as follows:

"(1) The inheritance behavior of neoplasms is that of a Mendelian recessive. (2) Double cancer parentage yields 100 per cent tumor strains, except where some individuals die of infections before they reach the cancer age. (3) Single cancerous parentage yields heterozygotes (transmitting but not themselves developing cancer) in the first hybrid generation. These, whether inbred or hybridized with other heterozygous individuals, yield cancerous progeny, approximately in the proportion of 1:2:1. (4) The mating of a cancerous with a heterozygous individual gives approximately 50 per cent cancerous and 50 per cent heterozygous offspring. (5) Double noncancerous parentage yields 100 per cent noncancerous strains. (6) The tendency to cancer, therefore, is inheritable, as no character except one which is hereditary can behave in this manner. This segregating out of a character is the test of heredity. (7) The tendency to tumors of specific organs and of specific types is also inheritable. For example, this stock has yielded strains of 100 per cent lung tumor, or 100 per cent alveolar carcinoma of the mammary gland, or 50 per cent liver adenoma, or 37 per cent kidney tumor."

Here we might inject into this paper the speculative value of what applied eugenics would do to cancer and tumor production, provided Dr. Slye's work is true.

To end the discussion as to the etiology of cancer, we have left staring us in the face the fact that the etiology is unknown. Whatever it might be, it stimulates some epithelial cell or small group of cells to an abnormal growth.

Differentiating the above described growth from normal cells, we have a number of characteristics which evince themselves. Foremost among these is the failure of these abnormal cells to obey the inhibitory laws of normal cells. By this I mean that in a normal organ we have continually forming new cells to replace old destroyed cells. These new cells are developed in the normal way as they are needed for the normal performance of that organ. When such numbers are developed that the function may be normal, each cell is inhibited from further mytosis by the mere presence of its brothers. In a malignant growth this law is not observed. One might say that these tumor cells are bolshevik and, regardless of the inhibitory force exerted upon them by surrounding brothers, they continue to divide by mytosis and by their excessive activity replace and destroy their brethren who are attempting to do the physiologic work of that organ.

As further evidence of the dysfunction of these cells, we have the production of an abnormal enzyme which is capable of digesting and destroying normal cells which stand in the way of production of these abnormal cells, so that we frequently have presented to us on the necropsy table an organ composed almost entirely of this new growth. These abnormal cells further resemble their bolshevik brethren in the characteristic that they will not work, so that in spite of the fact that we have an organ which, though larger than normal and with many times the normal quantity of epithelial cells, is still wholly incapable of performing its normal function.

Further evidence of the relation of these cells to our bolshevik brothers is the tendency to refuse to remain at home. This characteristic of migration is technically known as metastasis. These cells feel entirely at liberty to enter either a lymph stream or a blood stream and migrate from their primary growth, that is, leave home for new fields of adventure. They set up new colonies which retain the essential characteristics of the home folks, and reproduce their kind in any tissue of the body.

We have selected the cancer cases from the Swedish Hospital for the last seven years, August 1, 1920, to August 1, 1927. In 15,391 cases admitted to the hospital we have an incidence of 1.08 per cent lues. In 409 cases of carcinoma we have an incidence of 1.06 per cent lues. This is interesting in view of the rather copious literature that has appeared which has suggested that a positive Wassermann is frequently obtained in cases of advanced cancer. This series does not show that the Wassermann reaction will give a false positive in cancer cases. The positive cases have been checked and, where a positive Wassermann was obtained, clinical findings and history obtainable showed the patient had both lues and cancer.

From 15,391 cases admitted to the hospital we have had 409 cancers. This is 2.66 per cent.

The following tables show the age incidence, the anatomic distribution and the ultimate results.

I. Gastrointestinal 181.
  A. Squamous cell, esophagus 2.
  B. Columnar: Stomach 83, pylorus 21, colon 38, rectum 21, gallbladder 9, pancreas 7.
II. Respiratory 8.
  A. Squamous 8, larynx 7, tonsil 1.
III. Skin and its appendages 104.
  A. Squamous: Lip 4, ear 2, toe 2, face 11, shoulder 1.
  B. Columnar: Right breast 43, left breast 49, thyroid 2.
IV. Female genital 75.
  A. Squamous: Cervix 27, vagina 1.
  . Columnar: Uterus 34, ovary 10.
V. Male Genital 9.
  A. Squamous: Penis 1.
  B. Columnar: Testicle 1, prostate 7.
VI. Urinary 10.
  A. Squamous: Bladder 10.
VII. Miscellaneous 14; lymph glands 6, sinuses 3, parotid 2, endothelioma 1, eye 2.

Patients who died after leaving hospital (arranged numerically) 84; stomach 17, right breast 9, colon 9, left breast 6, bladder 5, rectum 5, cervix 5, uterus 5, pylorus 4, prostate 3, ovary 2, gallbladder 2, pancreas 2, clitoris 1, tongue 1, larynx 1, antrum 1, bone 1, lymph glands 1, choroid 1, maxillary 1, lip 1.

Patients who died before leaving hospital (arranged numerically) 116; stomach 28, colon 19, rectum 10, pylorus 9, uterus 6, gallbladder 5, liver 5, right breast 4, left breast 4, bladder 4, pancreas 4, cervix 2, larynx 2, ovary 2, cervical glands 2, vocal cords 1, antrum 1, mediastinum 1, esophagus 1, face 1, prostate 1, toe 1, thyroid 1, general 1.

Patients living at present time 76; left breast 19, right breast 14, uterus 14, cervix 8, stomach 4, colon 4, rectum 3, bladder 2, lymph nodes 1, ear 1, sinus 1, pylorus 1, scalp 1, prostate 1, endothelioma, ovarian 1, testes 1.

Unknown 133.

Age incidence:

10 to 20 years	1
20 to 30 years	7
30 to 40 years	45
40 to 50 years	110
50 to 60 years	105
60 to 70 years	110
70 to 80 years	31
Females	265
Males	144
Total	409

Metastasis was present in sixty per cent of all cases at the time of entrance to the hospital.

The histologic and clinical study of cancer early forces one to observe that all cancer growth is not of the same rate. We have presented to us from time to time clinically a case which develops a carcinoma of the mammary gland, for instance, and in two months the patient is dead, with metastases scattered throughout the body. We have but recently studied a carcinoma of the mammary gland which was present twenty-five years before the patient's death.

Histologically there is a variation in the type of cell formation and of cell structure in various tumors. These variations have attracted the study of many men, particularly Broders, pathologist at Mayo Clinic, who limited his study to squamous cell tumors and it is his opinion that by the type of cell he can prognose the rate of tumor growth. Greenough of Boston has attempted to do the same type of classifying in the columnar cell tumors.

In general, these classifications rest upon the variation of the cell from a normal adult cell and in general we have the law that the more embryonic the tumor cell becomes, the more rapid its growth and the more malignant the tumor. We have then presented to us a course of treatment for cancer in the fact that we have cells of varying deviation from a normal cell and we must be able, in the less malignant type of tumor, to influence the cell that is but little different from its normal companions.

We have, as illustration of chemical therapy, special drugs such as salvarsan for spirochete, quinine for malaria, and if we are to cure cancer by chemotherapy, we have to develop some chemical which has selective powers for abnormal epithelial cells. One can readily speculate as to the difficulties in this procedure.

Some progress has been made by various workers, as Blair Bell with his colloid of lead, Ochsner and Kallemberg with their colloid of gold. At the present time there is work being done with colloid of arsenic which may lead to some curative agent. We may apply this knowledge to a specific chemical that has selective power for abnormal epithelial cells.

At the present time I wish to urge upon the society the reasonableness of enucleating large tumor masses wherever possible. I believe this is sane surgery. We cannot conceive of a man refusing to open an abscess because there is a large collection of pus present. I say this because without doubt the body's protective agencies are capable of and do destroy large numbers of wandering cancer cells. One need but study the surrounding lymph glands to see evidences of this fact.

There may be some form of radiology, either x-ray or radium, that can be used in many cases with some beneficial effects. However, my experience with these agents has led me to be less optimistic than many of my fellow practitioners.

CANCER STATISTICS

A STUDY OF SEATTLE RECORDS *

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The following resume, taken from the records of the Health Department of the City of Seattle, was an effort on my part to determine, with some degree of accuracy, first, the answer to the much disputed question whether or not cancer is increasing or whether the increase is more apparent than real, and, second, whether or not the efforts of the medical profession are reducing the mortality of the disease.

Many surgeons and investigators of ability do not hesitate to acclaim the astounding increase of cancer in both sexes coming under their observation, while others of equal ability and sincerity in their convictions are just as certain that the seeming increase is due to the laity being better educated to the possibilities of malignancy and seeking medical aid sooner, whereby a diagnosis is made earlier. Furthermore, in most hospitals there is a competent pathologist who makes sections of all tissue removed and the diagnosis is made certain. This procedure was rarely used up to a decade ago.

Since the expectancy of life is now approximately fifty-eight years and, cancer being a disease of advanced life, Paget's opinion is borne out that, if people lived long enough, they might all eventually die of cancer. Many surgeons of talent claim a high percentage of five year cures in cases treated early, while others agree with the late Dr. Murphy that patients coming under his observation with frank carcinoma will die of that disease.

In this resume I have taken only the cases which were definitely diagnosed as malignant and have made no distinction between carcinoma and sarcoma. I have omitted recorded deaths of tumors nonmalignant in character. These benign tumors which may become infected, or due to their locations may cause pressure symptoms or other complications such as hemorrhage or tortion, will produce death just as a malignant growth, by invading an adjacent structure and forming metastases. Benign tumors in origin may, and often do become malignant and these cases have been classified as malignant.

I have tabulated the general cancer deaths and then computed the special organs affected, using the international clasification of causes of death,

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thus dividing cancer deaths into the buccal cavities, stomach and liver, peritoneum intestines and rectum, female genital organs, breast, skin, other organs not specified.

The tables which I have prepared unmistakably show an increase in cancer deaths which cannot be explained by better diagnosis and the increased expectancy of life because the diagnosis of two or three decades ago was as correctly made of external organs as it is today, and probably more so because the modern medical man may be depending too much upon instruments of precision rather than upon trained hands and eyes. It must be borne in mind, however, that we are dealing with the terminal stages of the disease and are not considering the general improvement in the early diagnosis of cancer.

In cancer of the breast there is little doubt as to the correctness of the classification recorded, as the organ is easily accessible and in the earliest stages the disease is suspected and the diagnosis readily made in the later stages. The same explanation is true in considering carcinoma of the cervix, the commonest form of uterine cancer. It is hardly conceivable that a patient may have a fatal termination without an examination by a medical man and the correct diagnosis tabulated.

Cancer of the fundus is not as readily or as easily diagnosed and, therefore, some allowance must be made for such cases so reported, but considering the great discrepancy as to the number of cases of cancer of the fundus in comparison to that of the cervix, the percentage would not be appreciably altered.

In considering the increased mortality of gastric carcinoma, one must certainly take into consideration the modern methods of diagnosis which were entirely lacking a few years ago. The early clinical signs may be slight or entirely absent. Therefore, the increase in the mortality table of recent years is undoubtedly due to the correct diagnosis, made principally by the roentgen-ray which has been the greatest contribution to aid in making the diagnosis.

Deaths from cancer of the small intestines and colon, which have been more difficult to diagnose, have undoubtedly been incorrectly classified. Many cases of death, reported as intestinal obstruction, were probably malignant in origin and the primary cause not recognized.

Cancer of the rectum gives a clinical picture which is unmistakable, especially in the terminal stage and, on account of the accessibility of this organ, the diagnosis has been correctly made and the death properly tabulated. There have been no cases of cancer of the peritoneum reported and on account of its comparative rarity it is not of importance.

Cancer of the liver as reported in these statistics has always been secondary, there being no case reported of a primary lesion. On account of its close association with other organs of digestion, secondary metastasis has been most common. The next most common organ to metastasize to the liver has been the uterus. In practically all cases tabulated cancer of the liver has been in the terminal stage. Therefore, there has been small chance of error in correctly signing the death certificate.

Out of this series of cases there have been reported but four fatalities of skin cancer. Therefore, on account of its infrequent occurrence, little consideration has been given to this condition.

Cancers tabulated under the head of other organs give a wide distribution of malignant tumors. Under this list have been classified carcinoma of the pancreas, spleen, kidney, brain, prostate, lungs, thyroid, esophagus, testicles, penis and bones. On the superficial organs, such as the testicles, penis, thyroid and bones, the chance of improper diagnosis and wrong classification is not probable while, on the other hand, in the deeper organs such as the kidney, brain, pancreas, lungs, etc., where a mistaken diagnosis is not only possible but probable, there may be considerable discrepancy in the percentage of cases reported fifteen or twenty years ago and those of today.

The same rate of increase is noted in cancer of the buccal cavity, where there is the least likelihood of mistake being made in diagnosis. It is unquestionably presumed that all of these cases of death have been correctly classified and the chance of error is reduced to a minimum.

If one believes the increasing mortality is due to the increased expectancy of life, cancer being a disease of advanced age and, therefore, much more frequent than formerly, it naturally follows that some deaths reported a few years ago before the cancer age appeared, could not now be classified as cancer. The chart below does not prove this explanation to be the case.

You will observe since 1907 the gradual but steady increase in cancer mortality. Furthermore, if the increased expectancy of life superinduces an increased number of malignant cases, it naturally should follow that the age of cancer deaths also should increase, but by referring to the chart quite

YEAR	MALE	FEMALE	BUCC. CAVITY	STOMACH AND LIVER	PERIT. INTEST REC.	FEMALE ORGANS	BREAST	SKIN	ALL OTHER
1907-08	30	41	2	31	11	19	7	0	1
1908-09	40	50	4	42	15	16	6	0	7
1909-10	50	81	8	54	21	18	17	0	13
1910-11	61	71	10	55	21	19	8	0	19
1911-12	59	77	9	54	13	34	9	0	17
1912-13	65	80	12	57	23	21	13	0	19
1913-14	102	88	14	73	32	35	13	0	23
1914-15	99	88	18	83	26	26	16	0	18
1915-16	112	106	21	81	40	33	12	0	31
1916-17	107	113	13	84	31	34	19	0	39
1917-18	124	140	21	93	37	52	24	0	37
1918-19	127	134	24	91	41	43	23	0	39
1919-20	154	150	25	140	44	36	24	1	34
1920-21	170	146	32	113	53	39	35	1	43
1921-22	147	168	14	107	58	61	24	0	51
1922-23	148	195	24	128	61	58	24	1	47
1923-24	186	182	27	128	57	62	26	0	68
1924-25	168	202	17	113	70	57	37	0	76
1925-26	207	239	19	139	82	69	44	1	92
1926-27	196	232	22	147	63	66	45	0	85
TOTAL	2352	2583	336	1813	799	798	426	4	759

Fig. 1. Record of cancer deaths according to the international classification.

the reverse is the case. All through this series of cases the age of death is practically the same, varying only from 54.8 in 1908 to 59.9 in 1925. Again, it is claimed by some that the more frequently autopsies are performed, the more common it is to find that the clinical diagnosis of carcinoma made before death had to be changed at the necropsy table.

Wells, who maintains that there is little or no increase in cancer deaths, as explained in a paper published in the *A.M.A. Journal,* in 1923, said that in 178 autopsies performed, 33 were found to be nonmalignant which had been diagnosed cancer before death, but he did not state how many cases, if any, were found to be carcinoma at autopsy which were diagnosed nonmalignant prior to death. It certainly is not unreasonable to presume that the same diagnostic error may be made in either case. Therefore, no change in the percentage table could be expected from this source.

In going over the death rates of the Health Department in preparing this paper, there was a great number of death certificates signed peptic ulcer. I am certain that, if an autopsy had been performed and the lesion examined pathologically, many of these cases would have been transferred to the cancer column.

These cases have all been taken from the City Health Department. It has been inferred that the mortality would be greatly decreased in the rural districts, because patients from outside are attracted to the city by the reputation of its surgeons and by the favorable hospital care that is available. On this account it is natural to assume that the mortality table is greater than the population justifies. While this true, it is also a fact that few cases of malignancy among these transient people remain long in the hospital. When a diagnosis is made and a prognosis given, it naturally results in immediate method of treatment or, if the case is far advanced, the patient is advised to return to his home. The number of these so-called foreign patients dying in the city following surgical treatment were comparatively few, considering the number of deaths tabulated, certainly not enough to make any appreciable difference in the percentage column.

The tables which I have prepared surely show a real and not an apparent increase in cancer deaths and this in my opinion will continue until the cause is discovered and the proper treatment adopted. On account of the reduction of mortality in early life of the infectious diseases and diseases of adult life with the gradual lengthening of life expectancy, more and more people will reach the cancer age.

In figure 1 I have tabulated the cancer deaths according to the international classification. It shows the greatest increase in gastric and hepatic carcinoma, with stomach cancer greatly predominating. This is due, I believe, to changes in the mode of living of the past few years. Today everyone is in a hurry, whatever his activities may be. Everything must be done in great haste, and our eating and the preparation of our food is no exception.

Year	Under 5	5 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	Average	Total
1907-08	0	0	0	1	9	13	20	17	10	1	0	56.3	71
1908-09	0	0	0	4	9	15	29	20	10	3	0	54.8	90
1909-10	0	0	0	4	6	28	43	29	20	1	0	55.5	131
1910-11	0	0	0	2	7	32	37	31	20	2	1	56.2	132
1911-12	0	0	0	0	3	32	45	36	17	2	1	57.5	136
1912-13	0	0	0	1	11	26	39	32	27	7	2	56.0	145
1913-14	0	0	0	2	13	40	62	45	18	10	0	57.6	190
1914-15	0	0	2	0	12	27	48	54	37	6	1	59.8	187
1915-16	0	0	1	3	18	38	61	52	37	6	2	57.1	218
1916-17	0	1	1	6	10	34	58	65	36	7	2	57.9	220
1917-18	2	2	0	7	13	42	84	75	32	7	0	56.0	264
1918-19	0	2	1	2	23	53	61	68	41	9	1	57.2	261
1919-20	1	0	0	6	18	59	75	82	55	8	0	57.5	304
1920-21	0	0	1	5	18	56	75	89	52	19	1	58.0	316
1921-22	1	1	2	2	22	53	94	86	40	14	0	58.0	315
1922-23	0	2	0	4	15	51	89	110	57	14	1	59.7	343
1923-24	3	0	4	5	16	51	94	110	66	19	0	58.5	368
1924-25	0	1	2	8	22	60	90	117	53	15	2	58.3	370
1925-26	1	1	2	3	21	65	119	124	87	23	0	59.9	446
1926-27	2	3	0	6	17	81	105	121	73	19	1	59.4	428
TOTALS	10	13	16	71	283	856	1328	1263	788	192	15	57.3	4935

Fig. 2. Ages at which deaths from cancer occurred in Seattle over the twenty year period, July 1, 1907, to July 1, 1927.

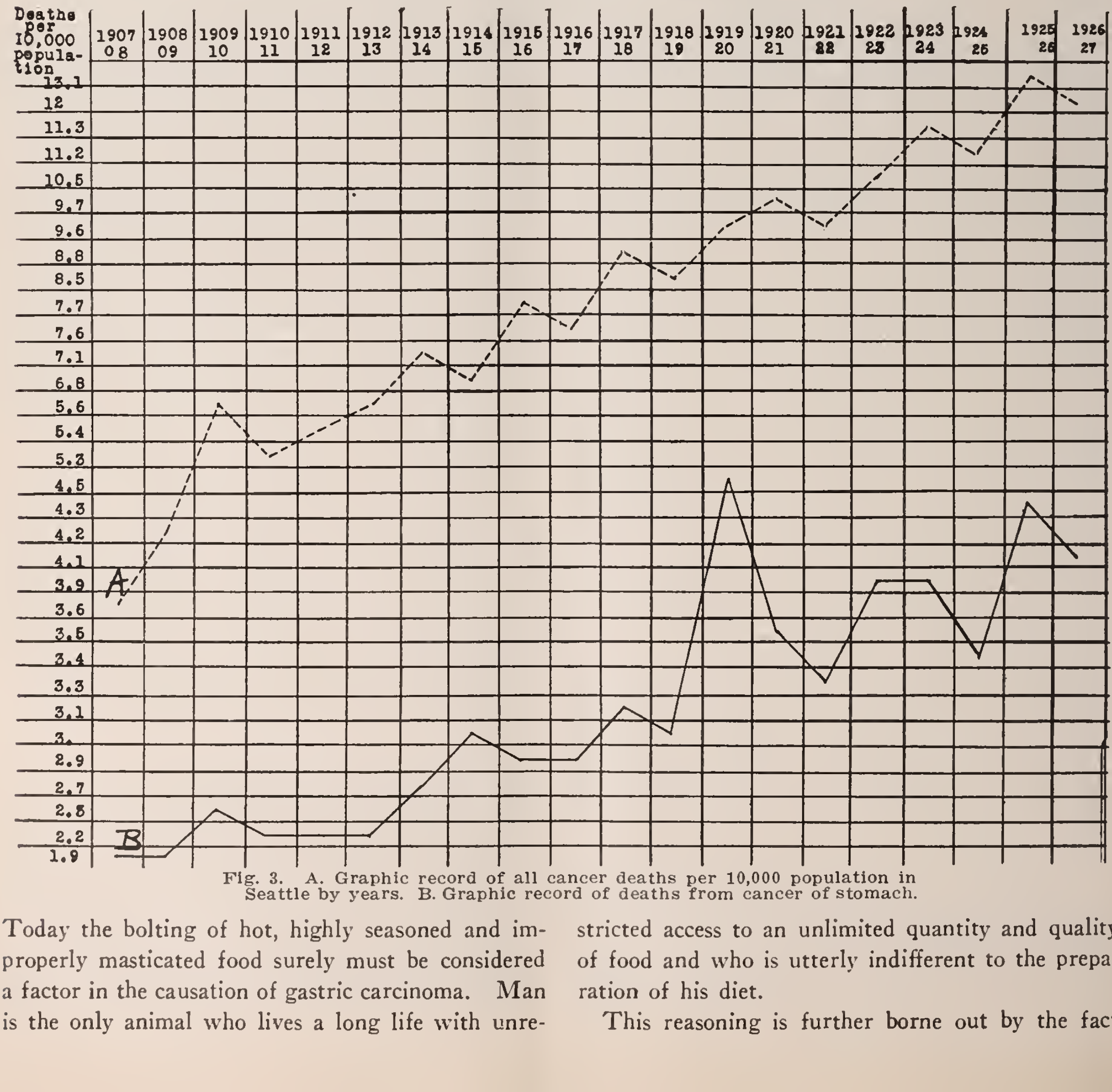

Fig. 3. A. Graphic record of all cancer deaths per 10,000 population in Seattle by years. B. Graphic record of deaths from cancer of stomach.

Today the bolting of hot, highly seasoned and improperly masticated food surely must be considered a factor in the causation of gastric carcinoma. Man is the only animal who lives a long life with unrestricted access to an unlimited quantity and quality of food and who is utterly indifferent to the preparation of his diet.

This reasoning is further borne out by the fact

	1907-08	1916-17	INCREASE	PER CENT	1916-17	1917-28	INCREASE	PER CENT
Population	199,500	291,700	92,200	46	291,700	355,000	63,300	22
Cancer Deaths	71	220	149	210	220	428	206	95
Location—								
Buccal Cavity	2	13	11	550	13	22	9	69
Stomach and Liver	31	84	53	170	84	147	63	75
Peritoneum Intestines and Rectum	11	31	20	182	31	63	32	103
Female Organs	19	34	15	78	34	66	32	95
Breast	7	19	12	171	19	45	26	137
Other	1	39	38	3800	39	85	46	118

Fig. 4. Summary of statistics, on which this paper is based.

that marriage licenses have decreased in Seattle by more than 50 per cent in the past twenty years. In 1906 9,708 were issued, while in 1926 there were but 4,397. Less marriages surely mean less home life, thus indicating that more and more people depend upon restaurants and delicatessen shops for their food, where the methods of preparation are not to be compared with the careful methods of the modern housewife. Furthermore, investigators have demonstrated that cancer is exceedingly rare in primitive races compared to its frequency in highly civilized people.

Figure 2 shows the number of deaths by ten year groups over this period of twenty years. In studying this chart it is noted that the mortality is comparatively low until the age of 30 and increases notably until 70, when the decrease is sharply defined. The average age of death has remained practically the same during the whole twenty year period, standing almost stationary at the average of 57.3 years. If the age expectancy is 58 years, these cancer patients die before that period, thus demonstrating that, in spite of the prolongation of life due to the progress of medical science, the life expectancy of this disease has remained the same.

In figure 3 is shown a graphic line of all cancer deaths and another of cancer of the stomach. It is noted that both lines advance sharply upward, showing the almost annual increase in cancer deaths reported. A begins in 1907-8 with 3.6 deaths per 10,000 population and rises to 13.1 and 12 deaths in 1926 and 1927 respectively. From the year 1909, when 5.6 deaths per 10,000 were reported, to 1918 with 8.5, a difference of 2.9 is noted. The increase was less marked than during the folfollowing ten year period, when it was most pronounced, rising from 8.5 in 1918 to 13.1 in 1926, a difference of 4.6. This marked increase during the past ten years is undoubtedly due to the great improvement of the present day methods of diagnosing disease in general and cancer in particular.

Figure 4 is a summary of the statistics gathered for the basis of this paper and to the most conservative critic the alarming increase of the disease must be apparent. It will be noted that the most striking point is the great discrepancy in the percentage column of the first compared with the second ten year period. This is due to the more accurate precision in filling out death certificates as prescribed by the various health departments and to increased knowledge in making a correct diagnosis of the disease. I am referring, of course, only to the records obtained in the Health Department of Seattle but I am confident from what has been published from time to time in the literature, that the same percentage of increase will be found to exist throughout the nation.

DEATH RATE PER 10,000 POPULATION
COAST CITIES — 1925-26
(Taken from *Spectator*, Oct., 1927)

Seattle (Based on Health Dept. Census Survey)	13.1	12.0
Seattle (Based on Report of Hoffman in *Spectator*. Census from Polk's Directory)	10.1	11.5
Tacoma	11.4	13.1
Spokane	14.3	15.3
Portland	12.4	13.0
Sacramento	......	18.1
San Francisco	16.1	15.9
Oakland	11.3	12.2
Berkeley	12.2	12.4
Fresno	5.3	7.1
Los Angeles	9.1	9.2
Long Beach	14.9	10.6
Pasadena	15.5	17.6
San Diego	15.5	16.5

Fig. 5. Death rates per 10,000 population in Pacific Coast cities, 1925-26. (Taken from The Spectator, Oct., 1927.)

Figure 5 is a copy of an analysis taken from an insurance journal, *The Spectator,* published October 13 of this year, from which I have taken the tables published for the coast cities. Again we note the percentage of increase is practically the same for all the cities enumerated and no doubt the author made his study in an entirely different manner from the method that I have used in making this analysis but the ultimate result is the same in both cases.

CONCLUSIONS

1. The great increase in cancer is confined principally to two groups of organs, the alimentary and the reproductive.

2. Cancer has increased from 30 to 40 per cent in the past twenty years.

3. The many published reports of cancer cures have led only to the confusion of the public and to the possible unjust criticism of the medical profession.

AGRANULOCYTOSIS

CASE REPORT

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This little girl, E. Van N., was seven years old. She lived in a good home and had always been well except for a few brief attacks of fever which her father attributed to tonsillitis. Her mother died six months before, it was said from kidney disease, following childbirth. Father is well.

Her sickness began suddenly, with sore throat, fever, anorexia and slight swelling of anterior cervical glands. On the second day the condition appeared to be an ordinary tonsillitis. Throat swabs were negative for diphtheria and Vincent's organisms. The following day she developed a hemorrhagic gingivitis. The gums had much the appearance of scurvy. At that time there were no ulcers present and there was but little prostration, the general condition was good, but anorexia was marked. There was no pain. The throat seemed improved and the neck glands were nearly normal. On the following day, the fourth of her illness, she had hemorrhage from the nose. The gums, inner side of lips and part of floor of mouth were swollen and black.

She was removed to the Tacoma General Hospital and preparations made at once to give blood transfusion. This stopped the bleeding for about fifteen hours, when it recurred. The mouth condition was worse and prostration extreme. She received daily transfusions of citrated blood, but lost ground, the hemorrhage recurring at shorter intervals from nose and throat. Hoping larger amounts of uncitrated blood might be more effective, on the fourth day in the hospital she was given 350 c.c. whole fresh blood by the Percy method and again on the following day 400 c.c. in the same manner. The effect on her general condition and on the hemorrhage was only temporary.

The mouth showed black sloughing crusts on lips and necrosis and sloughing of the gums. The teeth became loose, breath very fetid. There had been no exudate nor membrane in the throat, but tonsils were black and sloughing. There was nearly constant oozing of blood from nose in spite of careful packing, and the stools were black. There were a few petechial spots on the skin which was pale but not jaundiced. The temperature varied from 101° to 106.4° until tenth day, when it was down to 99.5° but higher before death. She failed rapidly, became irrational, then comatose and died on the tenth day of her illness.

Her w.b.c. on entering the hospital was 600 cells with 2 per cent polymorphonuclears, 98 per cent lymphocytes. Two hours later, following transfusion it was 1100 with 3 per cent polymorphonuclears. Later counts were 1950, 1350, 2250, 600, 1700, the count being better immediately after transfusion. Granular cells varied from none to 6 per cent. Red cells varied between 3,000,000 and 2,000,000. The laboratory noted, "no abnormal condition in either white or red cells, except central pallor in red cells." On the last day of her illness there were twelve per cent monocytes noted. Hemoglobin ranged from 35 to 50 per cent. Blood platelets varied from 50,000 to 100,000. Coagulation time about three minutes. Bleeding time from nine minutes to several hours. Cultures from throat swabs showed nothing of importance. Blood culture taken a few days before death showed a pure streptococcus viridans. The blood Wassermann was negative. The urine showed nothing unusual on daily examinations.

AUTOPSY

By Dr. P. A. Scott, March 11, 1928. This is the body of a white girl about eight years old. The body is cold. Rigor mortis is marked of the jaw and slight of the extremities. Postmortem lividity is moderate of the back of the trunk and legs. Body nourishment is poor and muscular development fairly good. The bony framework is slender and symmetrical. There are a few petechiae of the inside of the arms and skin of the body beneath the axillae. The skin and deep tissues of the face over an area of about 3 cm. in diameter are dark blue-black with gangrenous changes which extend through the cheek to the buccal surface, the lower and medial margins of this area begin almost exactly in the left corner of the mouth. The lips are scaly and fissured superficially and they and the gums are covered with thick, sticky, black exudate. The gums are blue to black and are soft and necrotic. The teeth are extremely loose and it is difficult to examine the tissues of the mouth without dislodging them. The gangrenous tissue involves nearly all of the left side of the cheek and extends deep into the pharynx. Both tonsils are a sloughing gangrenous mass. Fetor oris is nauseating.

The subcutaneous fat of the midline of the trunk is thin and pale yellow. The peritoneum and covering of the small bowel are pale grey and glistening. There is no free fluid in the abdomen. The appendix, sigmoid part of the colon and the spleen are normally free. The foramen epiploicum is patent. The costal cartilages are soft. There is no free fluid in the pleural cavities. The lungs are blue-grey outside and are normally free. The esophagus is empty, the lining is smooth and pink. The tracheobronchial lymph glands are soft and wet and up to 1.5 cm. in diameter. The lining of the trachea and larger bronchial tubes is grey-pink, mottled with distended pink blood vessels. There is a little frothy fluid in the lumen. The pulmonary arteries contain a little fluid blood and the linings are smooth and glistening. Cut surfaces of the lungs are pink and wet. There is no noteworthy change of the lining of the common iliac vessels or of the inferior vena cava and aorta. The pericardial sac contains a little straw colored fluid.

The heart is in systole. The lining of the heart chambers and covering of the heart valves are pale grey, smooth and glistening. The myocardium is pale grey-red. The splenic vein contains fluid blood. The glands in the gastrohepatic ligament are slightly enlarged and wet. There is no noteworthy change of the gallbladder or large bile ducts. The kidneys are rather pale grey-pink. The capsules strip easily, leaving a smooth surface. The cut edges bulge slightly. The markings are pale but distinct. The right pelvis is distended, although the calyces themselves show little change. The ureter is also distended, the lining pale grey and glistening. No cause of obstruction is seen in this ureter. The left ureter shows no noteworthy change.

Blood cultures showed a pure culture of streptococcus viridans.

Microscopic sections of the bone marrow showed it composed almost entirely of fatty tissue and very little cellular structure. The granular cells are absent. Most of the cells seen are medium sized, oval-shaped cells with large clear cut nuclei and pale cytoplasm. There are also smaller round cells resembling lymphocytes. Sections of the lungs show the air sacs and internal alveolar walls filled with free blood. There is also a good deal of edema in some areas. Sections of the small bowel in different levels show a good deal of blood in the mucosa. The glands are lined with high columnar cells with the nuclei crowded close to the base of the cells. Sections of the kidneys show the cells of the convoluted tubules edematous and swollen. In some places the cells are free in the lumens. The glomerular capsules are thin and the intraglomerular spaces filled in many places with a little fluid. There is no essential change between one kidney and the other. There is a marked amount of blood in the mucosa and submucosa. Lymphoid tissue is thin and scanty. Sections of the heart muscle show the cells markedly swollen and in some places the outlines of the cells are indefinite and cloudy. There are many pyknotic nuclei. In some places the muscle bundles are almost entirely destroyed.

DISCUSSION

In attempting to classify this case, one is confronted by our lack of knowledge regarding the etiology of many blood diseases. Several conditions must be considered. Acute leukemia, acute aplastic anemia, infectious mononucleosis or monocytic angina, agranulocytosis or agranulocytic angina are among those whose symptomatology overlap, and which include most of the symptoms presented in this case.

Acute leukemia may present exactly this clinical picture, and undoubtedly the blood picture may be a similar one, assuming that death came before the usual time for developing a leukocytosis. The autopsy findings are confusing, however, since there is absence from the bone-marrow of even the immature forms of granular cells, characteristic of leukemia.

Acute aplastic anemia also closely resembles this picture in some cases, but the onset is said to be more insidious and a gangrenous stomatitis is not always present. However, from both clinical and histologic findings this case could be classified as aplastic anemia, except that the anemia was never very extreme. Monocytic angina or infectious mononucleosis presents also much the same clinical picture, but it has not been reported in children, and shows also a marked increase of large mononuclear cells, usually 80 per cent. This disease runs a benign course, and is important from the standpoint of prognosis in considering this group of cases. Attention to this condition seems to have been first directed by Turk, who made a diagnosis of leukemia in the case of a young man with necrotic stomatitis and angina, swollen glands, large spleen, reduction of white cells, fever and prostration. He gave an unfavorable prognosis, but a few weeks later he was amazed to find the patient recovering. The condition seems to be definitely infectious.

In 1922 Schultz of Germany described a disease, to which he gave the name agranulocytosis. He believed it to be a distinct clinical entity. The symptoms were sudden onset with fever 104°, prostration, necrotic lesions in the mouth and throat or other mucous membranes, slight jaundice, rapid loss of strength, and death in a few days. The most characteristic features of the blood findings were marked leukopenia, the total white count being commonly a few hundred cells, and granular cells nearly or quite absent, no alteration of the red cells and absence of immature elements of the blood.

Schultz stresses the importance of absence of a hemorrhagic diathesis or of thrombopenia in making a diagnosis. The disease occurred in middle-aged women, there being twenty-two women and three men in twenty-five cases reported. Bantz treated a case in a child four and one-half years old. While Schultz insists that lack of hemorrhagic tendencies is characteristic of this disease, Zadek and others reported cases showing a thrombopenia and marked tendency to hemorrhage. Several German writers insist that agranulocytosis is but a symptom of sepsis and that hemorrhage may or may not occur.

Since Schultz's paper a number of cases have been reported in this country. In several of these definite septic processes have been found, the most notable being due to bacillus pyocyaneus.

In considering these cases, two facts seem well established:

1. Absence or reduction of granular cells may be produced by a variety of toxic agents, as bacterial invasion, the x-ray or radium, certain drugs as benzol, thorium-X, arsenic compounds, etc., and perhaps other unknown toxins, and it is sometimes present in Hodgkin's disease.

2. The necrotic condition of the mouth and throat and other mucous membranes is secondary to the agranulocytosis and due to the absence of the defensive powers of the leukocytes, since it is commonly found when this condition is present, regardless of the nature of the causative agent.

In the case reported, streptococcus viridans was found in pure culture in the blood. It is possible that invasion by this organism so depressed the functioning of the blood-forming organs that hemorrhage and breaking down of the tissues resulted, as noted at autopsy, these in turn causing death. Or it is possible that the destruction of the bone-marrow is due to some unknown toxin and the presence of the streptococcus in the blood is a sequel to the absence of the normal protection afforded by the granular cells.

OUR INHERITANCE AND RESPONSIBILITY IN MEDICINE *

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It is an adventure for those responsible as well as for me to offer in your program such a paper as I am about to present. Custom has well nigh decreed that your time be given wholly to technical topics, with a few acrid words injected at times in regard to medical legislation and industrial accident boards. It is hoped that you will not be altogether displeased by taking thought of our inheritance from the fathers of medicine, and that a brief outline of our history will result in a renewed feeling of our respsonsibility to carry on. There is no pretense of exhaustive original research made for this paper and it is hoped that free quotations will not be interpreted as indolence in its preparation or as plagarisms.

Satisfactory knowledge of the history of medicine begins with the Greek Hippocrates in the fourth century B.C. This is so true that medicine previous to Hippocrates is considered prehistoric. Medical practice had been going on to be sure. The earliest known physician dates at 4500 B.C. Travelers in Egypt may pay their respects to Dr. Inhotep at the pyramid he erected in 3000 B. C., he who taught that diseases were caused by the anger of a god, so that medicines could only assuage pain, and magic alone by incantations and prayers could remove the disease. Inhotep, indeed the prophet of a long line of magicians, sorcerers, charlatans, faith healers, and what not that are far from extinct today.

The edicts of Hammurabi of Babylonia, given in 2000 B.C., set forth regulations for the practice of medicine, a scale of fees and penalties for malpractice. These edicts are found on a black stone eight feet high with 1114 out of 2540 original lines of vertical writing still preserved. On it may be read, "If a doctor has treated a man for a severe wound and has cured the man he shall take ten shekels of silver; but if he has caused the gentleman to die, one shall cut off his hands." The writings on the stone are surmounted by a carved figure of Hammurabi, the King, receiving the law from the Sun God, strangely suggestive of Moses on Mt. Sinai. Readers of the old testament will find therein many excellent hygienic regulations presaging preventive medicine.

Of course, all during the ages that man was coming up from his prehistoric state, nature had been doing just as much to heal the sick as nature unaided will do today. And man had been doing just as his fellow animals had been doing, helping nature in its attempts to heal. Just as the dog licks his festering wound, man at the dawn of reason, having learned that nature purged the overburdened digestive tract and, further, having noted that eating certain plants would do the same thing, arrived at obvious conclusions and began the use of drugs. Just so, the infinitely slow process of accumulating knowledge went on wherever man was emerging into a state of reason, be it in China, Egypt or Babylonia. Coincident with this stage of development, man was rising from savagery sufficient for a primal sympathy of man for man to be felt. Right then did the conception of medicine occur. It was said by the medical historian, Dr. Payne, that "the basis of medicine is sympathy and the desire to help others" and by Hippocrates of old, "wherever there is a love of humanity there will be love of profession."

Based, then, on primitive knowledge and primal sympathy, medicine struggled up with the general plane of civilization only to become warped by mysticism and superstition, until at 400 B.C. we find its state of perfection to be a sad state of imperfection. Facts were hidden by a confusing fog of false and fanciful conceptions, mingled with unfounded religious beliefs and unwarranted superstitions.

In Greece there were four hundred temples built to Asklepios, son of Apollo the god of healing, and to Hygeia, the daughter of Asklepios, that were administered by a priesthood known as Asklepiads. Osler the great, and the great wag, was wont to refer to Mrs. Eddy's cult of today as the bastard progeny of the Aesculapian idolatry. Following the simile, we might compare the great temple of Epidaurus, near Athens, to the mother church at Boston, the Athens of America. Its extent is indicated by the fact that its sumptuous assembly hall seated 20,000 people and its athletic stadium 12,000. The practical wisdom of the old priests of magic is shown by the fact that they chose as sites for their temples spots conducive to health, with mineral springs, hot springs, invigorating air and natural beauty. They made much use of athletic training and required a regime of diet and bathing in preparation for the hocus pocus magic rites of the temple. There are clinical records of their work which when read require no comment.

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* Read before the Thirty-fifth Annual Meeting of Idaho State Medical Association, Twin Falls, Ida., Aug. 29-31, 1927.

These from Epidaurus:

"I. Alopecia. Heraecus of Mytilene is bald and petitions Asklepios to restore his hair. An ointment is applied over night and in the morning he has a thick crop of hair. II. Dropsy. Cut off the patient's head, hold him up by the heels, let the water run out, clap on his head again. III. Man with one eye. Ointment in empty socket at night, another eye in morning." Simple enough. The paganism of the Asklepiads is shown by the heartless cruelty to those about to die. Lest they defile the sacred courts of Asklepios they were carried to the gates and cast out on the hillside to expire alone.

Such was the stronghold of paganism, and it was its last stand in the struggle with Christianity, when Christianity appeared later on to supersede the cures of the heathen god by the miraculous healing of the saints. Four centuries B.C. marvelously and opportunely out of the fog of false premises emerged an Asklepiad, Hippocrates, to be the true father of modern medicine. Walter Pater said, "From the lifeless background of an unprogressive world the Greek stepped forth to set things going." Another has said, "The Greek created the principle of progress and except for the blind forces of nature nothing moves in this world that is not Greek in its origin." This is as true as truth in the realm of medicine.

Hippocrates and his school began careful observation and honest free thinking based thereon. The genius of Hippocrates is revealed in his own words: "I have written this down deliberately, believing it is valuable to learn of unsuccessful experiments, and to know the causes of their nonsuccess." He observed, he recorded, he concluded. He said, "To know is science; to believe one knows is ignorance." To read of his school and their work is to be alternately astonished at their acumen and accuracy and dumbfounded at their ignorance and misconception. Hippocrates, being the father of medicine, used his parental prerogatives to influence the ethics of medicine, and our richest inheritance from him is the Hippocratic oath, familiar to every well trained man of medicine to this day.

From Plato, a father of philosophy, a prolific writer, and a contemporary of Hippocrates, may be gleaned sidelights on the practice of their day from the layman's point of view. Hear Plato's warning: "When a man goes of his own accord to a doctor's shop and takes medicine, is he not quite aware that soon and for many days afterward he will be in a state of body which he would rather die than accept as a permanent condition of his life?" Again, "If a carpenter falls sick he asks for a rough and ready cure; an emetic, a purge, a cautery or a knife. These are his remedies and, should any prescribe a course of dietetics, he says he sees no good in a life spent in nursing his disease to the neglect of his customary employment; and, therefore, bidding goodbye to this sort of a physician, he resumes his ordinary habits and either gets well and lives and does his business, or his constitution fails, he dies and has no more trouble."

The Hippocratic school accomplished much at the beginning of the march of progress by means of observation and thought. But with those tools alone the mysteries of nature were not and cannot be unravelled. Had they been sufficient, the Greeks would have done it. Hippocrates, for instance, feeling his way toward auscultation said, "You shall know by this that the chest contains water and not pus, if in applying the ear during a certain time on the side, you perceive a noise like that of boiling vinegar." A fine start with an observation; but with nothing more between observation and thought the conclusion was obviously erroneous. The lack was experimental investigation. In this case was the pus there? Could Hippocrates and Aristotle, who seized his torch and carried it farther, have grasped the value of *experiment* in the advancement of knowledge, the pages of history would relate a different story and the dark ages of medicine might have been lightened.

After the days of Hippocrates the men of medicine read their Greek and recorded an occasional observation, but spun a maze of theoretical conclusions, which enmeshed and well nigh strangled them. In the second century A.D., came Galen of Pergamos, a Greek, who did his major work at Rome. He is, next to Hippocrates, the greatest figure of ancient medicine, being a prodigious worker, a keen observer, a daring experimenter and a philosophical thinker. His experiments were elementary, indeed, in the light of 1700 years later, but it is noteworthy that he was within sight of discovering the blood 1500 years before it was finally discovered. Galen knew that the valves of the heart determined the direction of the blood entering and leaving the organ, but failing to recognize that the heart was a pump, regarded it as a furnace to heat the blood. His keen observation is shown by his clear description of pulmonary tuberculosis, its infectious nature, and treatment by climate and milk diet. His mistakes seem ludicrous to us as, for instance, his continued support of the doctrine of four humors, viz: blood, phlegm, yellow bile and black bile, which were controlled by heat, cold, dry and wet, and which in harmonious combination constitute eucrasia; and in improper combination constitute dyscrasia. Such is a typical error of philosophic meanderings not controlled by experiment.

Galen was a doughty controversialist and we must thank him for his stand against the Methodists who maintained that their whole business in the healing art was with disease as found, while he held that his business was with the causes of disease. Time proved Galen to be overwhelming in his superiority to his contemporaries and so deadly level did the plane of intelligence continue that he predominated medical thought throughout the period of medieval medicine, for 1500 years. He has been dubbed the medical pope, whose infallibility was not questioned until Paracelsus, the Luther of medicine, of whom more later.

It must not be concluded that men forgot the healing art during these centuries from Galen to Paracelsus. It is a matter too close to every day human comfort to be forgotten. While the European intellects were in eclipse the torch of progress was carried with the seat of learning to northern Africa and eastern Asia; from the banner of the Cross to the pennant of the Crescent. How inextinguishable was the torch, and how devotedly was it kept aflame! Recall that it was centuries before the printing press, and knowledge was recorded by manuscript, and in this field was only transferred by the added task of translation. Overcoming such handicaps the seat of medicine crossed the Mediterranean. Aristotle fanned the flame of progress across to Alexandria in Egypt and there founded the Alexandrian school in 300 B.C. It was the first great medical school actually being equipped with laboratories, libraries and clinics. Here for the first time the human body was dissected, having been prohibited elsewhere by religious prejudice.

As the light of scienitfic medicine began to flicker and dim, it was nurtured awhile at Constantinople, but there it soon went out. During the seventh century the Crescent overran Turkey, Egypt, northern Africa and Spain, and was only turned back at Tours in 732 A.D. As these people ventured into the seats of western civilization they did so with open minds especially receptive for the sciences. With them medicine flourished in the eighth to the thirteenth centuries. Flowers of their school were Rhazes of Bagdad, who differentiated smallpox from measles, and Haly Filius Abius, a Persian of the Magi, living in the tenth century. In the following century came Avicenna the author of "The Canon," said to be the most famous medical text ever written. Avicenna was a statesman, a teacher, a philosopher, author and poet. In poetry he set the style for Omar Khayam and his Rubaiyat, which followed one hundred years later. His great medical work was a sort of compendium of all previous and current Graeco-Roman-Arabian medicine, ingeniously woven into a massive fabric of fallacy which served only to curtain the light of true science.

After the light that came from Greece had burned a time in Rome and then was carried from the Cross to the Crescent, medicine in Europe under the banner of Christianity was all but lost in the murky light remaining. The spirit responsible for the dreadful halt of progress would seem to be entirely explained by Tertullian, when he said, "Investigation since the Gospel is no longer necessary." During these centuries practice fell largely into hands of the clergy, and the monasteries of the day became actual medical centers in purpose and fact; and being no doubt largely beneficent in effect. The monks did not fail to use such knowledge as they had to impress the people in their ignorance with what were proclaimed to be miraculous cures. A case in point is that of St. Benedict, who founded at Monte Casino, on the site of an old temple to Apollo, a monastery which was virtually a clinic. His miracles became so numerous that a later abbot, Desiderius, required four volumes to relate them. Somewhat of their value may be suggested by the case of Henry II, Emperor of Bavaria, who came to Monte Casino to be cured of a stone in the bladder. Benedict, as a special favor to royalty, proceeded to work a painless cure. Not having the blessing of anesthesia, Benedict operated while Henry slumbered, opened the bladder, removed the stone, and when Henry awoke he not only found the stone in his hand but the wound healed without a scar during the night. On such a foundation of scientific infamy the Benedictines conducted a teaching clinic at Monte Casino during the ninth and tenth centuries.

However, there still burned in Arabia our little light and even a little light is so much better than utter darkness. Time and providence finally brought forth for Europe a brave heart in a man whose supreme desire was more light in medicine. Constantinus Africanus of Carthage in the twelfth century thirsting for knowledge journeyed to India, Arabia, and Egypt and brought back to Christian Europe not useful knowledge so much as the spark of the fire of the desire for knowledge, which kindled a flame whose light exposed the dark chicanery of the Benedictines and their type. This man wrote and taught in the school at Salerno. Here near Naples in a lovely setting, about natural health resorts, he started a medical school of great importance, which lasted 700 years until destroyed by the mighty little Corsican, Napoleon Bonaparte.

The Norman kingdom of south Italy and Sicily had been a cosmopolitan community of Latins, Greeks and Saracens, with the three languages in every day use. Here the gold of Greek culture had been kept bright in some degree and there was current a degree of hospitality for pure knowledge not tarnished with the ecclesiasticism of Rome nor the fanciful fallacies of the near east. In its inception, Robert, son of William the Conqueror, King of Normandy, was cured here, and there was dedicated to him the one great work which gave Salerno its fame, "The Regimen Sanitatis." This book was broadly used for centuries by the laity as well as the profession. Translations of it are easily at hand today. In them will be found the origin of many bits of familiar wisdom of which fair samples are:

"Great suppers do the stomach much offend,
Sup light if quiet you to sleep intend.

"Scorn not Garlicke like some that think
It only makes men wink, and drink, and stink.

"Horace in a verse of his rehearses
That water-drinkers never make good verses.

"A King that cannot rule him his diet
Will hardly rule his realm in peace and quiet."

During the dark ages in Europe frightful epidemics decimated the people—leprosy, erysipelas, scurvy, influenza, syphilis, and in 1348 the bubonic plague killed one out of every four of the entire population, or over sixty million in one year. And this while fanciful ideas twisted by religious prejudice and fostered by ignorance seemed to prohibit the pursuit of knowledge. In Arabia, on the other hand, one keen observer had actually recognized the parasite for scabies, and the Arabians were elaborate users of drugs, originating many of our present preparations. But they described the pit of the stomach as the seat of pleasure and the gallbladder as the seat of courage. So poor sick humanity could but suffer and die with but little help added to the kindly healing forces of nature. Really it was often true that the man was fortunate to whom the medicine man did not administer.

Happily, then as now, the dawn follows the dark and the little light that came from Arabia to Salerno in the hands of Constantinus Africanus kindled others, and those others groping with the dawn, advanced the outposts of medical science by the same simple process as did Hippocrates, open minded observation and independent thought. Surgery began its scientific growth before medicine, and much of merit had its inception at Salerno. Galen had taught that pus was good for wounds and for 1200 years boiling oil was poured on wounds to promote suppuration.

Finally after twelve centuries one Henri de Mondeville advocated clean surgery. From somewhere had come the cry, "let there be light," and there was light, and sturdy, honest, blunt Mondeville had the honor to be the instrument of illumination at about 1300 A.D. He and Guy de Chauliac were from the school at Montpelier. Here and at Bologna medical schools in connection with universities had sprung up, fostered largely by student guilds. Mondeville's independence of the monastic tincture then so prevalent is shown by his saying, "If you have operated conscientiously on the rich for a proper fee, and on the poor for charity, you need not play the monk nor make pilgrimages for your soul." This may be a comfort to a modern surgeon, when he takes thought of the long tomorrow.

After Mondeville had penetrated to the inmost secret of successful surgery, clean surgery, the idea sank back into obscurity for another 200 years until it was taken up by the herald of the dawn of philosophic medicine, one Phillipus Theophrastus Aureolus Paracelsus Bombastus von Hohenheim, known to history as Paracelsus, and well characterized by the name Bombastus. He was the personification of independence, the incarnation of the spirit of revolt and freely admitted that he was right. He had travelled as far east as China, where he probably learned and scorned their doctrine of the pulse. This is that each part and organ has its own pulse and, as in a stringed instrument each chord has its own tone, so in a human body, if the pulses are in harmony it means health and by the same token, if there be discord, there will be disease.

Paracelsus on his return began for the first time to teach medicine in the vernacular, instead of the classic Latin. He was called the Luther of medicine after displaying his contempt for the infallible Galen and the meandering Avicenna by burning their works before his class. He wrote a book on wound surgery and, having caught the idea of Mondeville, taught the rudiments of asepsis, announcing that nature healed wounds and could be aided by cleanliness and withholding irritating and contaminating applications. He greatly stimulated chemistry but also recognized that each man had a defensive chemical laboratory within himself which should have the opportunity to heal without interference. Living today, he would take a violent exception to the eighteenth amendment, it is reported, and to fundamentalists in general either in the realm of science or theology.

Pareculsus dates around 1500 A.D., and after he had heralded the dawn, Andreas Vesalius actually tore the curtain off the lights of intellectual progress and unfettered the growth of knowledge in medicine. Vesalius was a Belgian who studied in Venice in a monastic hospital, at which was also a young Basque, Ignatius Loyola, destined to control universities, counsel kings, and found the most famous order of the Catholic church. At universities named in honor of Loyola, today the anatomy of his fellow student Vesalius is being taught, for Vesalius was the first real anatomist. Others knew much anatomy before. That superman of the Reniassance, Leonardo da Vinci, actually left 750 artistic anatomic drawings. But it was Vesalius who reduced anatomy to a science and taught what he saw, not what Galen said.

He came as a link of progress at a great age in history, that of the revival of learning, the invention of printing, the discovery of America, the Reformation. Vesalius released medical science as Luther did religion. He taught at Padua and after careful dissections produced his great work, "De Fabrica Humani Corporis," which marked an epoch. All this Vesalius did by his thirtieth year and story says his life ended in tragedy at fifty years. It is told that in Spain he cared for a nobleman and, attempting a postmortem examination, found the heart still beating. His life was spared under sentence of a pilgrimage for his soul's salvation. Shipwreck and resulting exhaustion soon released him from his obligation.

Logically the new real knowledge of anatomy gave an impetus to surgery and most noticeable and typical of this was Ambrose Pare of Paris. He taught the tieing of bleeding vessels instead of the use of the cautery, the use of the truss for hernia and the use of artificial limbs. The popular appreciation of his value to the nation is well shown by the fact that, when the dreadful massacre of St. Bartholomew's day was planned, Pare by the royal mandate of Charles IX was the only protestant to be spared, being detained in the royal palace for that purpose.

After Vesalius the next epoch-making man was William Harvey of England. With this man begins the real spirit of modern scientific medicine. He journeyed to Padua and studied under Fabricius, the successor of Vesalius. Then, Vesalius having torn the curtains from the torch of illumination, Harvey, using the light so released, began experimental investigation. Not satisfied with the state of information as to the movement of the blood in the body, he boldly advanced from the status of what he had heard and what he could see to use his hands, and by vivisection he felt the heart beat and soon had traced the circulation throughout its course, and was able to publish his epochal "De Mortu Cordis." This marked the end of tradition and the beginning of investigation.

The backbone of ignorance and theological domination was indeed broken. The spirit that prompted the pilgrims to venture forth in the Mayflower was in the air, and it was such a spirit that prompted the contemporaries and successors of Harvey to draw our attention from our racial shame, the dark ages, by the brilliancy of the illumination from experimental investigation. It is now the seventeenth century, the Elizabethan age, Shakespeare and Milton are writing, Rembrandt is painting, Bach is composing, Newton grasps the law of gravity, Bacon and Spinoza are making a new philosophy. In medicine the ball was set rolling, the army of progress was enlisted, accumulated knowledge was printed and diffused, and nothing could prevail against the Greek principle of progress at last unleashed and in full cry. First one and then another added his contribution to medical lore. Morgagni, in Italy, started the profession to think in terms of the anatomy of disease; Boerhaave, in Holland cast aside doctrines and studied the phenomena of disease as facts; Auenbrugger, in Germany, announced the development of percussion as a means of diagnosis; Laennec, in France, met the challenge and devised the stethoscope; Floyer, in England, began to use a watch to time the pulse; George Martine, in Scotland, began the use of the clinical thermometer; John Hunter struck the keynote of the period when he gave Edward Jenner the advice, "don't think, try," and Jenner did try and rescued a doomed continent by vaccination.

So was the spirit and service of medicine carried forward for the benefit of man for another two hundred years. True scientific medicine only began less than a century ago with Koch in Germany, Pasteur in France, and Lister in England, almost within the memory of our elders of today.

The details of the development of modern medicine are vast in volume and filled with interest and romance. They are well known to this audience and beyond the scope of this paper. Suffice it to say, that experiment has continued to supplant unsupported theory and, instead of a few supermen towering as peaks above the level of ignorance, multitudes of workers supported by governments and endowments have carried on, and are today carrying on unending painstaking investigation in all the fields of medicine and her allied sciences. They are wise in their doubt of so-called authority but eager to establish facts. They are gradually disclosing the causes of disease and presenting proven measures for their prevention, amelioration and cure. Be thankful that the torch did not go out and the illumination continues to grow in penetrating power, and that no worker in the field is yet satisfied with the present state of our knowledge.

Laennec, in his treatise on mediate auscultation, details the birth of an idea. He says, "In 1816 I was consulted by a young woman labouring under the general symptoms of diseased heart, and in whose case percussion and the application of the hand were of little avail on account of the great degree of fatness. Immediate auscultation being rendered inadmissable by the age and sex of the patient, I happened to recollect a simple and well known fact in accoustics, and fancied it might be turned to some use on the present occasion. The fact I allude to is the great distinctness with which we hear the scratch of a pin at one end of a piece of wood on applying our ear to the other." Thereupon Laennec devoted years to the development of his stethoscope and recording his observations with it, only to do himself the injustice when writing his book to say, "Nature's secrets are more frequently betrayed by fortuitous circumstances than obtained by the force of scientific efforts."

The modesty of Laennec was unlike that previous Frenchman Pare who, in dedicating his surgery to the king, his protector, with complete frankness declared that "posterity will not be able to surpass us save by some additions such as are easily made to things already discovered." That was said 350 years ago. Can it be that any today are prone to fall into the same error? Rather let us keep ever in mind the wisdom of Descartes, another Frenchman of Pare's time, when he said, "All that men know is almost nothing in comparison with what remains to be known." We will still subscribe to Descarte's declaration and, in consideration for our inheritance from our alma mater back to Inhotep, we will surely foster every genuine agency for the acquisition and dissemination of scientific knowledge in medicine. If we may not give light in medicine we may at least try to disseminate light by reflecting it in our works and words.

Apropos of this State Medical Association meeting, recall if you will how Galen travelled to Alexandria; how the Arabians gladly learned from the Greeks and Romans; how Constantinus Africanus went to India and Arabia; how Parecelsus went to Bombay and far Cathay; how Vesalius, a Belgian, studied and taught in Italy; and how William Harvey ventured from London to Padua. The application is obvious and it is pleasing to note that men have gathered here at considerable sacrifice from all over the state of Idaho and from neighboring states, and that our noted guests, at large sacrifice, have come great distances from all four points of the compass, each of us fulfilling his responsibility to further knowledge of medicine for the benefit of sick mankind. And to quote Laennec again, "It would no doubt be expecting too much of physicians in private practice to devote much time to the acquisition of this knowledge in a hospital where only it can be acquired completely and certainly; but they may readily and compendiously obtain the necessary opportunities through the kindness of friends attached to these establishments." To such friends we of Idaho give thanks today for their kindness.

UNUSUAL CASE OF POLYDACTYLISM. In the case reported on by Dunlapu P. Penhallow, Washington, D. C. (*Journal A. M. A.*, Aug. 25, 1928), there is a complete absence of the thumbs on each hand, each thumb being replaced by two complete and functioning digits which resembled the third and fourth fingers. No hereditary history could be elicited in this case of a colored laborer, aged 50, who was well developed and nourished and of large frame. The hands are symmetrical. Each digit is separate from the other and is completely formed with three phalanges and with perfectly formed nails on each terminal phalanx, each set of phalanges having a separate metacarpal. On the palmar view of the hand, what would correspond to the thenar eminence is very broad but is not rounded and elevated as is the thenar eminence; and from this broad eminence emerge the two digits on each hand. These digits function independently of each other and can be individually flexed and extended, abducted, and opposed to the other fingers, thus showing a complete and independent set of flexor and entensor tendons and muscles, lumbricales muscles, and also an apparently complete and separate nerve supply to each finger, with a separate cerebral center. Roentgen-ray examination shows the trapezium in each wrist to be slightly enlarged and articulating with two metacarpals. The metacarpals and the phalanges are perfectly formed. The right foot is normal. On the left foot there is a double great toe. There is no subdivision of the great toe, except for a part of the distal phalanx.

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EDITORIAL

MODERN MEDICAL ETHICS

ON THE HOPELESS CASE

One of the embarrassing problems that consultants frequently encounter is presented by the inevitably fatal case. When called in consultation to examine a patient who must die, the problem of what to tell the relatives often arises. How shall it be managed? Shall the consultant frankly and bluntly say, "This patient is without hope. He can live but a few hours or a few days," as the case may be. Or shall he temporize? Many times the physician who calls in a consultant resents frankness and feels that he has been treated badly or discourteously, if an outspoken opinion is given that is not exactly in accord with what he has already said. Often he has had the patient under care for days, weeks or months without fully recognizing the imminence of danger. Sometimes he is a friend of the family as well as its physician and he prefers to keep up their faith and courage by glossing over threatening conditions and always with sincere and honest intent. But unfortunately the family does not always see it as he does and when, after a time, having been fed on promises real or implied which have not been fulfilled, "hope deferred maketh the heart sick" and in the extremity of their distress they request that a consultant be asked in. Unprejudiced by other than the facts, he may quickly recognize that all hope is indeed lost. If he tells the family there is no chance of recovery, sometimes resentment against all medical opinion becomes manifest.

Not infrequently all medical service is promptly dismissed and the relatives seek aid from cultists who, having no reputations to sustain, are prone to hold forth glowing promises of hope. This is especially true if the patient goes to christian scientists. If the consultant does not come out with what he regards as the truth, in the end his reputation suffers. But since he has been employed, not primarily to protect himself or the medical profession but to ascertain the truth for the benefit of the patient and the relatives, it is imperative that he shall not be misled. He knows the dangers of a mistake. He remembers that he has been called for an opinion based on his supposed learning and wisdom. If he is brusque and too outspoken, someone is sure to think him cold and heartless and he is likely to offend both family and physician who called him in. The best he can do will be to pass judgment as he sees it, but gently as possible, aiming to offend neither patient nor attending physician. It is nearly always good practice to hold forth every reasonable hope and to give encouragement wherever it is honestly justified. But, except in rare instances, the truth, the whole truth, and nothing but the truth is permissible. There are many ways of telling the truth, however, and if it can be administered under a psychologic analgesic, it will be better for all concerned.

The preceding applies to the management of the patient's relatives. As for telling the patient himself that his case is hopeless, that is quite another matter. Rarely is it advisable to let a patient suspect that hope has been abandoned. As a rule, he should be sustained and kept optimistic to the end. Courage may often be fortified by seemingly cheerful disregard of untoward symptoms, in the full knowledge that cheerfulness and hope are themselves excellent medicines. There are cases in which it seems necessary to tell a patient who is soon to die that his end is near. But these are few and far between and in most instances the telling should be left to the family, the family minister or lawyer.

THE PORTLAND STATE SOCIETY MEETING

The fifty-fourth annual meeting of Oregon State Medical Society, scheduled for Portland, September 20-22, will be unique among recent medical meetings in that all papers on the program will be presented by members of the society, with no attractions from men of other sections. This is a commendable policy for state meetings. The many other gatherings which feature distinguished members of the profession from well known medical centers offer a surfeit of external speakers. The state meeting naturally belongs to its own members and can well be reserved as an opportunity for them to demonstrate their labors in various branches of medical and surgical endeavors. The following program offers an admirable exhibition of the superior work being carried on by the Oregon profession.

In addition to the splendid group of papers to be presented, the scientific program will include a number of medical and surgical clinics at various Portland hospitals. The scientific program will also be supplemented by several interesting papers on some of the important economic and sociologic problems involved in the practice of medicine. The social and recreational features of the meeting will include the annual banquet, a complimentary luncheon by the Oregon Public Health League, the Second Annual Oregon Medical Golf Tournament, for which a number of attractive prizes will be provided, an exhibit of art by Oregon physicians, and several events for the especial entertainment of the visiting ladies.

An additional feature will be a number of displays illustrating the activities of the Society, the Oregon Public Health League and the American Medical Association, as well as several scientific exhibits. Of special interest, also, will be the commercial exhibits, at which many of the manufacturers of medical and surgical supplies and equipment will show their latest products.

The public educational aspect of the session will be cared for by a special program for the laity on the subject, "Keeping Fit." This will consist of actual demonstrations of periodic health examinations and a series of lantern slides and motion pictures dealing with periodic physical examinations and the prevention of disease.

PROGRAM

Thursday, September 20

Morning. Registration of Delegates and Members. Clinics at various Portland hospitals.

Afternoon. Clinics at various Portland hospitals. Second Annual Oregon Medical Golf Tournament. Meeting of Women's Auxiliary.

Evening. Public educational meeting: "Keeping Fit." Demonstration of periodic health examinations and program of lantern slides and motion pictures.

Friday, September 21

Morning. Breakfast Meeting of House of Delegates. Scientific Session.

Afternoon. Scientific Session. Open House at University of Oregon Medical School and Doernbecher Memorial Hospital, Marquam Hill.

Evening. Theatre Party.

Saturday, September 22

Morning. Breakfast Meeting of House of Delegates. Scientific Session. Complimentary Luncheon by Oregon Public Health League. An announcement of vital interest to every physician in the state will be made.

Afternoon. Business Session and Election of Officers. Scientific Session.

Evening. Annual Banquet.

THE ALL-OREGON PROGRAM OF PAPERS

Analysis of One Thousand Pre-Natal Clinic Cases. C. J. McCusker, Portland.

Analgesia in Obstetrics by the Gwathmey Synergistic Method. Charles E. Hunt, Eugene.

A University Health Service as an Educational Force for Scientific Medicine. Fred N. Miller, Eugene.

Back Pain and Its Treatment. Harry C. Blair, Portland.

Brain Abscess of Otitic Origin. Frederick A. Kiehle, Portland.

Carcinoma of the Lower End of the Esophagus. J. Earl Else, Portland.

Cardiac Shapes. T. Homer Coffen and George McKhann, Portland.

Congenital Pyloric Obstruction: Prophylaxis, Treatment. C. Ulysses Moore, Helen G. Dennis and Jessie L. Brodie, Portland.

Cysts of the Labia Minora. C. Julian Lunsford and Goodrich C. Schauffler, Portland.

Fifteen Years Experience with Spinal Anesthesia. George Norman Pease, Portland.

Hematuria. Franklin P. Johnson, Portland.

Malignant Tumors of the Bones with Special Reference to the Maxilla. Joseph A. Pettit, Portland.

Malta Fever in Oregon. G. C. Bellinger, Salem, and William Levin, Portland.

Paranasal Sinus Infection in Relation to Diseases of Childhood. Guy L. Boyden, Portland.

Postthyroidectomy Complications and Sequelae. Dean S. Seabrook, Portland.

Preliminary Report on the Absorption of Glucose Introduced by Rectum. Charles E. Sears and John R. Montague, Portland.

Principles and Technic in the Treatment of Colles' Fracture. Otis F. Akin, Portland.

Resume of the Results of the Use of Myrtillin and Neo-Synthalin in Diabetes. Blair Holcomb, Portland.

Some Economic and Sociologic Aspects of the Practice of Medicine. Clyde C. Foley, Portland.

Some Errors in the Diagnosis of Cancer. Otis B. Wight, Portland.

Surgical Collapse of the Lung. Jay R. Coffey, Portland.

The Decrease in Maternal and Infant Mortality in Oregon. Frederick D. Stricker, Portland.

The Differential Diagnosis of Thoracic Pain. Marr Bisaillon, Portland.

The Management of Sterility in Private Practice with Reference to Special Methods. Albert Mathieu and Goodrich C. Schauffler, Portland.

The Nephritis of Early Syphilis: A Case Report. John H. Labadie, Portland.

The Prognosis in Acute Coronary Occlusion. Albert L. Severeide, Portland.

The Rationale in Our Present Treatment of Peptic Ulcer. Wesley E. Gatewood, Portland.

The Use of Milk Injections in the Treatment of Pelvic Inflammatory Disease. Raymond E. Watkins, Portland.

The Value of Biopsy Material for Prognosis and Treatment in Cancer of the Cervix Uteri. Karl H. Martzloff, Portland.

OREGON ALUMNI ASSOCIATION MEETING

The Sixteenth Annual Meeting of the Alumni Association of the Medical Department of the University of Oregon will be held at the Portland Woman's Club, on September 18 and 19. This meeting promises to be a good one, and it is hoped that every member of the profession will avail himself of the opportunity of attending its various sessions.

The program is to consist of clinics during the forenoons, and papers during the afternoons, On Tuesday night, September 18, the annual banquet and business meeting will be held. On Wednesday night, September 19, the Alumni Association will have charge of the Portland City and County Medical Society meeting; with papers by Drs. Noble Wiley Jones, and W. B. Holden. Following is the program:

PROGRAM

Tuesday, September 18

9:00 a.m. Clinics, Good Samaritan Hospital. Drs. Otis F. Akin, Eugene Rockey and J. Farl Else.

1:30 p.m. Papers, Portland Woman's Club.

Dr. Walter W. Black, "The Treatment of Nonmalignant Stricture of the Rectum by Carbon-dioxide Snow."

Dr. Ira E. Gaston, "Infections of the Paranasal Sinuses."

Dr. A. G. Bettman, "The Psychology of Scars and Deformities."

Dr. Mearle Fox, "Cotton Dental Roll for Tar Drain."

Dr. Ivan M. Woolley, "Report of Case of Staphylobacteriemia With Recovery."

Dr. Edmund W. Simmons, "Nonspecific Protein Therapy in Allergic Conditions."

Dr. Richard P. Landis, subject to be selected.

6:30 p.m. Banquet and business meeting.

Wednesday, September 19

9:00 a.m. Clinics, St. Vincents Hospital. Drs. E. A. Sommer, E. W. St. Pierre and others.

1:30 p.m. Papers, Portland Woman's Club.

Dr. Banner Brooke, "Rectovesical Fistula."

Dr. Jay R. Coffey, "The Malresponse of Certain Goiter Cases to Iodine Therapy."

Dr. Harry M. Bouvy, subject to be selected.

Dr. Earl B. Brookbank, Paper on the subject of Phlebitis.

Dr. J. H. Snively, "The Life and Accomplishments of Luther Burbank."

WASHINGTON STATE MEDICAL ASSOCIATION MEETING

The annual meeting of Washington State Medical Association, held in Seattle on August 27-30, had a record attendance of three hundred seventy-nine physicians. The first day was devoted to a golf tournament at the Englewood Country Club. A mark of courtesy was shown by the local committee in charge of the affair in the awarding of prizes only to the out-of-town visitors. A dinner at the clubhouse concluded the day's entertainment. The annual meeting of the county health officers also took place on that day.

On the second day a brief meeting of the board of trustees and the house of delegates was followed by a morning session devoted entirely to a consideration of urologic problems. Dr. Arvid Anderson of Aberdeen read the opening paper, entitled "Stricture of the Female Urethra." Dr. Charles Teel of Bellingham reviewed personal experiences with diverticulum of the bladder. The Collings operation was described by Dr. C. F. Engels of Tacoma, while Dr. Alexander Hepler of Seattle told of "The Operative Treatment of Urethral Stricture." The concluding paper on "Perinephritic Abscess" was read by Dr. Alexander Peacock, of Seattle.

The section plan was continued in the afternoon program which was presented by orthopedic members of the association. A lantern slide lecture on shoes was delivered by Dr. Joe Brugman of Seattle. Dr. E. F. Eikenbary, also of Seattle, discussed "The Problem of Ankylosed or Partially Ankylosed Joints." An illustrated lecture on treatment of spine injuries was given by Dr. Roger Anderson of Seattle. Dr. Donald Murray of Seattle described the treatment of fractured extremities by the three-piece plaster-of-paris cast. Dr. Mitchell Langworthy of Spokane discussed "Injuries to the Spine in the Cervical Region."

On the third day the first guest speaker, Dr. Arthur H. Crosbie of Boston, Mass., delivered a lecture on the subject of pyelonephritis. Dr. Louis Buie, head of the division of proctology at the Mayo Clinic, described "Diagnostic Methods in Proctology for the Surgeon and the Internist." The afternoon session opened with a lecture on "Intestinal Obstruction" by Dr. Dean Lewis, professor of surgery at Johns Hopkins University. He has appeared before several recent meetings in the Pacific Northwest, where his lectures are always well attended. Dr. Frank Lynch, professor of obstetrics at the University of California Medical School, San Francisco, presented a paper on "Uterine Fibroids, a Study of Six Hundred Twenty-five Cases."

The last day of the convention opened with a meeting of the house of delegates. At this time Drs. E. A. Sommer and Jos. A. Pettit of Portland, spoke in the interests of the American Medical Association convention which will be held in their city next July. Both urged physicians of the entire Northwest to consider themselves personally responsible for the entertainment of the convention visitors, also suggesting the advisability of forming local entertainment committees at all centers where the guests may wish to make stopover visits.

The opening address on the concluding day was made by Dr. Lewis who discussed surgical lesions of bone. He warned against performing a radical bone operation until preliminary diagnosis by frozen tissue section had proved such a procedure to be justified.

It proved unnecessary for the program committee to seek in distant places for all of its guest speakers. One of the most interesting and authoritative lecturers at the convention was Prof. Trevor Kincaid of the department of zoology at the University of Washington, Seattle, who spoke on "Heredity."

Following the annual luncheon and meeting of the Public Health League of Washington, the final session of the convention opened with an address on "Medical and Surgical Treatment of Anorectal Diseases" by Dr. Buie. The last speaker was Dr. Crosbie, who gave his personal observations on the operation of prostatectomy.

The evenings were occupied by a banquet, at which Dr. Arthur Burns of Seattle acted as toastmaster, and by a dinner dance. Both of these affairs were well attended by visiting physicians as well as by their hosts.

The annual election of officers resulted as follows: President, Dr. F. H. Brush, Yakima; first vice-president, Dr. O. E. Anderson, Hoquiam; second vice-president, Dr. J. C. Shutt, Bremerton; Dr. C. H. Thomsen of Seattle and Dr. John H. O'Shea of Spokane were elected secretary-treasurer and assistant secretary-treasurer respectively. Trustees elected from the first district were Drs. S. L. Caldbick of Everett and D. C. Hall of Seattle. From the second district were chosen Drs. C. L. Smith and P. J. Gallagher of Spokane. Drs. Geo. Dowling of Seattle, E. W. Janes of Tacoma, and Mitchell Langworthy of Spokane were reelected as trustees of NORTHWEST MEDICINE. Drs. Frederick Epplen of Seattle and John O'Shea of Spokane were selected as delegates to the American Medical Association convention. Yakima was chosen as the next place of meeting of the state association.

The meeting marked the conclusion of a very successful year for the association under the presidency of Dr. Richard O'Shea of Seattle, who proved an able leader in planning for the annual meeting and personally spared no effort to make the visiting doctors feel amply repaid for their trip to Seattle.

THE TRISTATE MEETING

The meeting at Kenyon Hotel, Yellowstone Park, last month of the State Associations of Idaho, Montana and Wyoming was unique in that it was far distant from any city of these states, so that the members present were not deterred by professional engagements from attending the scheduled sessions. Accordingly the attendance was satisfactory from all the states, averaging about seventy-five registrations from each. The hotel has a commodious assembly hall, free from interference from swarms of guests, so that the scientific sessions were held under conditions favorable both for the speakers and the audience. Although several of the men on the different programs were detained from appearing for various reasons, interesting and instructive papers and addresses were presented on the three mornings of the meeting. Since abundant time was provided for sightseeing and social intercourse during afternoon and evenings there was a large audience of attentive listeners at all of the sessions.

An interesting feature, in addition to the set program of papers, was the meeting of Montana State Health Association. Beside other instructive features, special attention was centered on the address of Dr. Spencer of the U. S. Public Health Service at Hamilton, embodying the results of his investigations over a series of years in the tick problem. Since spotted fever, tularemia, and tick paralysis are all transmitted to men through the ticks on animals, each being a serious and frequently fatal disease, officers of the Public Health Service are endeavoring to discover measures to overcome this public menace. Dr. Spencer reported many fascinating and unusual experiments, through whose agency he hopes to develop a serum which may be used to counteract the effect of tick invasion.

It would be superfluous to attempt a description of the wonderful attractions of Yellowstone Park. Every one should purpose sometime to visit this most marvelous exhibition of natural forces, unrivaled by anything presented in other parts of the world. Advantage was universally taken by visitors to tour the park and gratify the natural desire to witness these wonders of nature. The universal opinion was expressed that this meeting was a success and doubtless will be a precedent for many similar ones in the future.

MEDICAL NOTES

THE AMERICAN COLLEGE OF SURGEONS will hold the eighteenth Clinical Congress in Boston, October 8-12. Headquarters will be at the Statler Hotel and meetings will be held in the ballroom of the Copley-Plaza Hotel and Symphony Hall. The Hospital Standardization Conference will be held in morning and afternoon sessions in the ballroom of the Copley-Plaza Hotel Monday, Tuesday, Wednesday, and Thursday. An innovation this year will be the commencement of the clinics in the Boston hospitals on Monday afternoon, continuing through the mornings and afternoons of the following four days.

Monday evening's program will include an address of welcome by the local Chairman, the address of the retiring President, Dr. George David Stewart, New York, the inaugural address of the new President, Dr. Franklin H. Martin, Chicago, and the John B. Murphy oration on surgery by Professor Vittorio Putti of Bologna, Italy. Tuesday, Wednesday and Thursday evening's sessions will be held in the ballroom of the Copley-Plaza Hotel. At the Wednesday evening meeting the visiting surgeons will be the guests of the Boston Surgical Society at a special meeting when the Bigelow medal is to be awarded. On Friday evening the Annual Convocation of the College will be held in Symphony Hall when the 1928 class of candidates for Fellowship in the College will be received. The fellowship address on this evening will be delivered by Dr. William J. Mayo.

The annual meeting of the Governors and Fellows will be held Friday afternoon and will be followed by a symposium on Traumatic Surgery to be participated in by leaders in industry, labor, indemnity organizations and the medical profession. Ether Day will be celebrated in the Dome Room of the Massachusetts General Hospital on Friday when a bronze bust of William T. A. Morton will be presented to the hospital. It was in this building that ether was first administered for the production of surgical anesthesia on October 16, 1846.

Several newly completed medical motion pictures produced under the supervision of the American College of Surgeons and approved by it will be shown during the Congress. Reduced fares on the railways of the United States and Canada have been authorized to those holding a convention certificate so that the total fare for the round trip will be one and one-half the ordinary first class one-way fare. Other outstanding features will be the exhibits. In addition to the commercial exhibits the departments of the College will present scientific exhibits. A number of distinguished foreign guests of international reputation have signified their intention of attending. The Chairman of the Boston Committee on Arrangements is Dr. Frederic J. Cotton.

OREGON

National Convention Planned. Mr. Will C. Braun, of Chicago, business manager of the American Medical Association, spent a week during August in Portland, where he conferred with local medical leaders in the interests of the national convention to be held there July 8-12 next year. Dr. E. A. Sommer, of Portland, has been appointed chairman of the local committee.

Banquet for Professor Williams. Dr. John Whitridge Williams, professor of obstetrics in Johns Hopkins University Medical School, was the guest of honor at a banquet held at the Arlington Club in Portland on July 25. Twenty colleagues and friends of Dr. Williams were present.

Health Expert Visits Portland. Dr. Wm. F. Snow of New York, president of the National Health Council, was a recent visitor in Portland, where he conferred with members of the medical profession and with officers of the Oregon Social Hygiene Society.

Veteran's Bureau Chiefs Exchange Posts. Dr. William C. Gibson, medical officer in charge of the United States Veteran's Bureau Hospital at Portland, has been transferred to the directorship of the Veteran's Hospital at Tacoma. His place will be filled by Dr. Paul I. Carter, of Tacoma. Dr. R. E. Baker, assistant director of the Portland institution, has been transferred to Palo Alto, California.

Visit from Rumanian Health Authority. Dr. P. Trisca, a prominent Rumanian statesman and public health authority, recently spent several days in Portland. He expects soon to be appointed to the position of Minister of Health in Rumania, and is making a tour of the United States in order to make a study of public health methods.

Completes Half Century of Practice. Dr. E. A. Romig, pioneer physician of Newberg, has retired after completing fifty-one years in medical practice in that city. He has disposed of his practice to Dr. Carl Knitter, formerly connected with the Sellwood Hospital at Portland.

Pioneer Receives Honorary Fellowship. Dr. Alfred Kinney of Seaview was recently awarded an honorary fellowship in the American Medical Association. The award was made at the last annual meeting of the national body in recognition of Dr. Kinney's record of more than fifty years continuous membership in the association. He also holds the distinction of having served as first president of the Oregon State Medical Society.

Visitor From Egypt. Dr. Robert Dolbey, of Cairo, Egypt, was a recent visitor in Medford. He is connected with the British Medical service, being director of a large hospital at Cairo.

Dr. R. A. Bissett has taken over the practice of Dr. Gordon Leitch at Tigard. He will be associated with Dr. Thatcher of Multnomah.

Dr. Clarence L. Gilstrap, formerly of Portland, has moved to La Grande where he will engage in practice.

Eastern Oregon Medical Society held its annual meeting at the Sacajawea Inn at La Grande on July 28, under the presidency of Dr. Alfred Johnston of Heppner. Among the guests of honor who delivered addresses at the meeting were Drs. Robert C. Coffey, Harold Bean, Ray Matson, Irving M. Lupton, G. C. Schauffler, Richard Dillehunt and Louis Poyntz, all of Portland, Dr. W. T. Phy of Hot Lake, and Dr. J. Tate Mason of Seattle, Wash. The meeting culminated in a banquet.

Officers of the Society were chosen as follows: President, Dr. John B. Gregory of Wallowa; vice-president, Dr. John P. Brennan of Pendleton; secretary-treasurer, Dr. Lewa Wilkes of La Grande; delegates to the State Convention, Dr. W. D. McNary of Pendleton and Dr. Thomas Higgins of Baker. Wallowa Lake was selected as the meeting place in 1929.

WASHINGTON

Recent Medical Licenciates. At the last examination, held by the Department of Licenses, July 16-17, the following physicians were granted licenses by examination:

Corneliussen, E. F. L., Seattle; De Riemer, R. P., Spokane; Dever, D. C., Seattle; Grieve, W. E., Iowa City, Ia.; Hanson, E. W., Tacoma; Hoxsey, G. E., Seattle; Leibly, Phyllis S., Seattle; Lemery, C. W., Seattle; Lindberg, A. L., Seattle; Nelson, Spokane; Norgore, Martin, Seattle; Rickles, N. K., Seattle; Rogers, P. M., Seattle; Soucey, H. C., Portland, Ore.

The following were granted licenses by reciprocity:

Ash, W. A., Atlantic, Ia.; Bowers, A. T., Seattle; Calvin, W. E., Seattle; Clay, H. T., Tacoma; Cox, O. H., Port Townsend; Cunningham, T. T., Seattle; Durkin, J. J., Compton, Calif.; Dymond, A. G., Seattle; Erben, H. F., Medical Lake; Flothow, P. G., Seattle; Greiner, W. R., Chicago, Ill.; Grigg, E. R., Butte, Mont.; Henry, J. M., Seattle; Hersey, N. L., Spokane; Hunter, K. P., Spokane; Johnson, D. W., Seattle; Johnson, H. W. E., Everett; Kinney, A. C., Seaview; Leibly, F. J., Seattle; Lower, R. A., Priest River, Ida.; Manley, T. M., Tacoma; Newman, W. E., Spokane; O'Connor, C. A., San Francisco, Calif.; Plumb, C. E., Los Angeles, Calif.; Schultz, A. L., Tacoma; Serrurier, L. R., Seattle; Spencer, W. L., Chicago, Ill.; Stewart, R. H., Spokane; Sweet, W. H., Ann Arbor, Mich.; Taylor, L. E., Orange, Calif.; Thorp, D. J., Rainier National Park; Van Mason, C. E., Okeana, Ohio; Wright, M. S., Monroe; Hodgson, S. H., Stevenson.

Seattle Offered Marine Hospital. Dr. L. D. Fricks, director of the United States, Public Health Service, recently presented to the city council of Seattle a proposition for locating a new five hundred bed marine hospital in that city. The public health service contemplates establishing an institution for the care of critically ill and convalescent patients, the present hospital at Port Townsend to be retained for chronic cases. The offer is contingent on the gift by the City of Seattle of a plot of ground suitable for the purpose. Several members of the Council have expressed willingness to accept the proposal and to deed to the U. S. Government the city owned land lying at the north end of Beacon Hill. This tract has been held for a number of years as a possible future site for a city-county hospital.

Medical Building at Camas. The latest city in Washington to boast of a new building devoted entirely to the use of physicians is Camas. The entire upper floor of a two story modern structure, recently completed by Mr. Paul Hinz, has been occupied by several doctors practicing in that town.

Hospital Authorities Visit Northwest. Over a hundred hospital superintendents, returning from the convention of the American Hospital Association at San Francisco, made stop over visits at Tacoma and Seattle. At the former city they were entertained at breakfast by local physicians and later taken for a sightseeing tour. At Seattle they were the guests of the Chamber of Commerce at a luncheon at the Olympic Hotel. Among the speakers at the luncheon were Dr. David C. Hall, president of the King County Medical Society and Dr. E. T. Hanley, city health commissioner.

Hospital for West Seattle. The West Seattle General Hospital at 6507 Fauntleroy Avenue has been opened for general use by medical practitioners in the district. The superintendent is Miss Winona Kupfer, a graduate of St. James Hospital, Butte, Mont. The new institution was formerly operated as a private hospital by Dr. Boudwin.

Asylum Methods Investigated. An exhaustive investigation of the methods of handling patients at the Sedro-Woolley hospital for the insane has been launched as the result of charges made by relatives of John W. Hesford, an epileptic patient who died at the institution. It is claimed that death was directly due to injuries inflicted by hospital guards. Public hearings in the case have been conducted at Sedro-Woolley, Bellingham and Seattle, former Judge Thomas E. Grady of Yakima presiding.

Improved Water Supply for Seattle. In response to continued protests concerning an offensive taste in the water supply of Seattle, Dr. E. T. Hanley, City Health Commissioner, and Mr. W. B. Severyns, water superintendent, have outlined a plan of extensive improvements. The medicinal taste has been more and more apparent each year. This is said not to be due to chlorination, but to algae which have increased greatly in the water stored at Cedar Lake. This increase has followed extensive logging operations in the region of the watershed. It is now planned to abandon the present settling basin at Landsburg, and to divert the water from Cedar River to Lake Youngs, which will serve as an enlarged settling reservoir.

Increase in Infantile Paralysis. During the month of August a number of cases of infantile paralysis were reported in several cities in Eastern and Western Washington. In the vicinity of Bitter Lake near Seattle, where a summer colony exists, the number almost reached epidemic proportions. Health authorities of King County have placed a ban upon bathing at this lake.

Retires from Public Health Service. Dr. Louis T. Seavey, for more than twenty-eight years a quarantine officer in the United States Public Health Service, retired on July 30, following his last official inspection at Port Townsend of an incoming steamer, the American Mail Line's President McKinley. At the time he began work in the quarantine service he found vessels only of the sailing type, and since then he has witnessed their almost complete replacement by modern steam and motor vessels. A reception in the veteran medical officer's honor was given on board the President McKinley by officials of the American Mail Line.

Physician Addresses Law Convention. Dr. William Allen Pusey of Chicago, Ill., professor of dermatology at the University of Illinois and past president of the American Medical Association, was numbered among the speakers at the annual convention of the American Bar Association, which was held in Seattle last month. Dr. Pusey's address dealt chiefly with the record of medical progress in the past fifty years.

Railway Surgeons to Meet at Seattle. The Great Northern Railway Surgeons Association has selected Seattle as the place for their annual convention next year. The meeting will be attended by over two hundred railway surgeons, it is expected. Dr. H. J. Knott of seattle is president of the association.

Candidate for Legislature. Dr. Geo. W. Overmeyer of Chehalis has announced his candidacy for the position of state senator from Lewis County. He has already served one term as State representative. He was also appointed as physician to the State Training School at Chehalis under Gov. R. H. Hartley.

Physician Appointed to Park Board. Mayor Frank Edwards of Seattle on August 6 announced the appointment of Dr. C. C. Tiffin as a member of the City Park Board.

Dr. H. M. Johnson of Toppenish has moved to Seattle after many years practice in the former city, where he twice served as mayor. A farewell luncheon was tendered him by the Toppenish Commercial Club.

Dr. Lyndon Taylor, formerly assistant superintendent of the Orange County, Calif., Hospital, has located for practice in Bellingham.

Dr. H. H. Quaife. who has been engaged in practice at Castle Rock for the past ten years, has been forced by ill health to retire. His practice has been taken over by Dr. C. W. Lane of Wenatchee.

Dr. Merle B. Snyder. until recently an interne at St. Luke's Hospital, Spokane, has opened an office at Chewelah.

Dr. U. S. Ford of Everson has disposed of his practice to Dr. Ross of Vancouver, B. C. He intends shortly to go to Philadelphia for postgraduate work.

Health Officer Appointed. Dr. J. H. Bartley has been appointed city health officer of Zillah.

Health Officer Named. Dr. J. T. Bartley has been appointed health officer of Zillah.

Wedding. Dr. J. A. Durant and Mrs. Anna Meagher, both of Everett, were married at Snohomish on August 2.

IDAHO

Dr. C. M. Cline of Idaho Falls, with Mrs. Cline and daughter, recently returned from a tour of Europe. While there Dr. Cline visited several famous clinics.

Would Retain Boise Hospital. At a reception in his honor at the Owyhee Hotel on July 16, Brig. Gen. Frank T. Hines, director of United States Veterans' Bureau, stated that he would do everything in his power to retain Boise as the headquarters of the Regional U. S. Veterans' Hospital. Should the war department decide to recall the present barracks quarters of the Boise Hospital for army use, a new hospital may be erected. If the Veterans' Bureau is to retain its present quarters it is expected, he said, that about $200,000 will be expended in improving the plant.

OBITUARIES

Dr. Henry Jacob Fleischer, Des Moines, Wash., a pioneer physician of Seattle, died at his home July 23, aged 70 years. He was born in Wisconsin in 1857, and graduated from Rush Medical College, Chicago, in 1879. He settled in Seattle forty years ago and practiced there until his retirement in 1918. He served for many years as Surgeon for the Chicago, Milwaukee & St. Paul Railway.

Dr. John Weeks Givens. Boise, Idaho, died at the home of his son in Boise on July 23, following an illness of several weeks, aged 74 years. He was born in Placerville, California, in 1854, and graduated from Bellevue Hospital Medical College in 1883. Soon afterwards he came west to occupy the position of Superintendent of the Blackfoot Asylum. He spent the years 1895 and 1896 in Baltimore and Los Angeles, afterwards returning to Idaho. In 1905 he was made head of the Orofino Asylum. He remained there until 1926, when he was forced by advancing age to retire. He was at one time president of the Idaho Medical Association. He held a national reputation in the field of psychiatry.

Dr. Henry C. McCarthy, San Francisco, Calif., died in that city on July 20, aged 50 years, following the effects of a self-inflicted wound. He had been partially incapacitated for surgical work for the past ten years, following an accidental infection of his hand. He was born in Iowa in 1878, and graduated from Rush Medical College, Chicago, in 1902. He practiced for several years in Spokane, Wash., and later moved to Hot Lake, Ore., where he was associated in practice with Dr. W. T. Phy.

Dr. George Kerr McDowell. Spokane, Wash., died at his home August 15, following a brief attack of pneumonia, aged 63 years. He was born in Ontario, Canada, in 1865, and graduated from Trinity Medical College, Toronto, in 1892. He practiced for several years at Staples, Minn., and at Billings, Mont., locating in Spokane in 1900, where he remained in practic euntil his death.

Dr. Lloyd Fisher Smith. Juliaetta, Ida., died at his home August 16, following a brief illness, aged 48 years. He was born in Michigan and graduated from the University of Oregon Medical School in 1908. He practiced in several cities of Washington and Idaho before locating at Juliaetta.

Dr. William Hamilton. Baker, Ore., died at the Protestant Hospital in that city August 4, aged 78 years. He was born in Iowa in 1850. and had been a resident of Baker for many years.

Dr. Wallace Alonzo Smith. formerly of Seattle, died in Portland August 28. The funeral services were held in Seattle August 30. He was born in 1876, graduated from the Hospital College of Medicine, Louisville, Ky., in 1907. He was associated with Dr. Koenig while in Seattle.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

DISEASES OF THE GALLBLADDER AND BILE DUCTS. A Book for Practitioners and Students. By Evarts Ambrose Graham, A.B., M.D., Professor of Surgery, etc.; Warren Henry Cole, B.S., M.D., Instructor in Surgery; Glover H. Copher, A.B., M.D., Assistant Professor of Surgery; and Sherwood Moore, M.D., Professor of Radiology, etc., (all of) Washington University School of Medicine, St. Louis. Illustrated with 224 Engravings and 8 Colored Plates. Cloth. 477 pp. $8.00. Lea & Febiger, Philadelphia and New York, 1928.

This work marks an epoch in our advancing knowledge of diseases of the bile ducts and gallbladder which began in our present generation with Kehr's work, in which he reported some 700 operations on the gallbladder, which was followed shortly at the beginning of the twentieth century by a report of some 4,000 gallbladder operations by the Mayos which first brought them into notice in the East, where they were on this account generally regarded as phenomenal liars. The authors of this work state that no comprehensive discussion of gallbladder diseases in English has occurred since 1905, when Rolleston published his book on diseases of the liver, gallbladder and bile ducts. However, the reviewer possesses Moynihan's treatise on "Gall Stones and Their Surgical Treatment," published in 1904 and again in 1905, which, while not strictly comprehensive, yet accomplished a great deal in popularizing knowledge of the subject through the forcible personality of its author, as was also the case in his characteristic work on duodenal ulcer. Since the first years of the twentieth century our knowledge of gallbladder and duct diseases has been advanced more by work at the Mayo Clinic than from any other source probably, owing to the greater amount of surgery done there on the biliary tract than elsewhere in the world. Within the past few years the brilliant original work of Graham and his coworkers, in the discovery and introduction of the dyes by which cholecystography has become possible, has perfected the diagnosis of cholecystitis and thrown much light upon the physiology of the gallbladder. They have thus established a new era in the progress of our knowledge of liver, gallbladder and bile duct diseases, and their book has an importance and authority in consequence far beyond that of the ordinary medical publication. The frequent incidence of cholecystitis is shown by the findings of Mentzer in 612 routine postmortem examinations at the Mayo Clinic of evidence of cholecystic disease in 66 per cent of cases.

The authors of this book estimate that 20 to 25 per cent of all adults have gallstones and 40 per cent have disorders of their biliary systems. The first 100 pages of this work are devoted to the anatomy and physiology of the gallbladder and ducts. The etiology of cholecystitis comprises infection chiefly through the lymphatics, uniting the liver and gallbladder, of hematogenous origin and arising first as an hepatitis. The infection passes from the adjacent liver to the gallbladder and after the occurrence of cholecystitis the latter infection may reinfect the liver through the lymphatics, so that a vicious circle is established which may be terminated by cholecystectomy. Infection of the gallbladder through the bile is comparatively rare. Cholecystitis also may be either the result or cause of cholesterol deposits in the gallbladder; in the walls, with characteristic strawberry appearance of the mucous membrane, or in the lumen with formation of gallstones. This cholesterol deposit in the wall or lumen of the gallbladder may probably occur without infection, owing to cholesterolemia, as in pregnancy, or to some disturbance of metabolism, chemistry of the bile, or state of the gallbladder that permits precipitation of cholesterol.

In 633 consecutive autopsies at the Mayo Clinic gallstones were found in 21.67 per cent. In all cases of gallbladder disease 70 per cent are associated with stones. (C. H. Mayo.) Mentzer, at the Mayo Clinic, found 90 per cent of patients weighing over 220 pounds had cholecystitis, whereas only 30 per cent of patients weighing less than 110 had this disease.

The authors stress especially the great frequency of chronic cholecystitis as the chief cause of chronic dyspepsia and they quote Blackford and Dwyer to show that its incidence is nearly equal to that of peptic ulcer, reflex appendicitis and gastric cancer all combined. They also note the wide variation in symptomatology. In differential diagnosis it seems to the reviewer that mention should have been made of the simulation of duodenal ulcer, of so-called pleurisy, of angina and of luetic perihepatitis to cholecystitis. In regard to the latter it is stated that syphilis of the gallbladder seems to be unknown but, on the other hand, syphilitic perihepatitis is far from uncommon and its symptomatology so closely resembles cholecystitis as to be indistinguishable from it. No case of supposed chronic cholecystitis should be operated upon without a previous Wassermann test.

Sections of the book are devoted to tumors of the gallbladder, and diseases of the bile ducts, including acute catarrhal icterus, cholangitis, stricture and tumors of the ducts and biliary fistulae. As would be expected, a very considerable portion of the book is given to the consideration of cholecystography from its conception by the authors, Graham and Cole, in 1923 to its present development as a diagnostic agent in cholecystic disease in measuring gallbladder function, or its concentrating and emptying ability. The blood is also examined when taking cholecystograms to determine the amount of retention of the dye (phenoltetraiodophthalein) in the blood after its intravenous injection as a measure of liver function. The enormous amount of work involved, after the authors had conceived the idea of rendering the gallbladder opaque to the x-ray by the administration of some chemical, may be judged by the experiments with some fifty agents before choosing the present dyes, isoiodeikon for testing liver function and for cholecystography, and iodeikon for cholecystography alone.

The presentation of this part of the subject is intensely interesting, of great practical value and authoritative. The authors favor the intravenous injection of 2.5 gm. of isoiodeikon in 30 c.c. of distilled water, or 3 to 3.5 gm. of iodeikon in 40 c.c. of distilled water. When the iodeikon is given by the mouth 4 to 5 grams are administered. The authors do not apparently accept the general opinion that the gallbladder may not be visualized in quite a large percentage of cases of duodenal ulcer (41 per cent of the errors in the cholecystography, Mayo Clinic) and also in some neurotic patients with achylia (Eusterman). The authors assert that nonvisualization of the gallbladder indicates pathology of the organ in 100 per cent of cases, with the exception of some extracystic factors mentioned. They also deny that normal gallbladder shadows are present in pathology of the organ. At the Mayo Clinic, however, in some 30 per cent of normal cholecystograms cholecystic disease was found at operation. The authors find inconsistency in the Mayo Clinic report of a diagnosis of cholecystitis clinically 85 per cent correct, but in autopsy findings at the Clinic in 1647 consecutive subjects 37 per cent had cholesterosis of the gallbladder, in the great majority of whom (87 per cent) there had been no history of digestive disturbance.

Jaundice and liver function tests receive ample consideration. The authors are accustomed to test liver function with the dye used to make cholecystograms. They find a normal retention in the blood of about 12 per cent in thirty minutes, but in cholecystitis there is a 27 per cent retention without jaundice, and a 55 per cent retention with jaundice. A high retention indicates poor operative risk. The last chapter of the book is devoted to the surgical treatment of cholecystitis.

This treatise is undoubtedly the most comprehensive work we now have on the subject, yet it is somewhat uneven in the consideration given different matters. WINSLOW.

DISEASES OF THE INTESTINES. Including the Liver, Gallbladder, Pancreas and Lower Alimentary Tract. By Anthony Bassler, M.D., F.A.C.P., Consulting Gastroenterologist, St. Vincent's, Peoples, and Jewish Memorial Hospitals, New York City, etc. Third Edition, Revised and Enlarged. F. A. Davis Co., Philadelphia, 1928.

This edition is brought up to date, giving in detail the use of the various latest methods of diagnosis and treatment. It is divided into twenty-two chapters, each dealing with some specific subject related to gastroenterology. In the opening chapter a clear and concise anatomy of the digestive system is followed by the physiology and chemistry of digestion.

One of the most important single agents in the diagnosis of gastrointestinal lesions is the use of x-ray. In this volume a complete description of technic and numerous plates and figures of both normal and abnormal conditions is to be found. The modern methods of diagnosing gallbladder disease by the use of analine dyes is clearly described. The early history of its use to test out liver functions to its adoption by Graham and Cole as a test for gallbladder function is given, together with a clear description of technic used. The subject of intestinal toxemia, or as Bassler calls it, chronic excessive intestinal toxemia, is dealt with in a broad and comprehensive manner, giving the history of the early workers in this field with their views, both past and present, as well as that of his own.

The closing chapters are devoted to diagnosis and treatment of parasitic diseases and various infections of the gastrointestinal tract, diseases of the rectum and, finally, diseases of the liver and pancreas. As would be expected of one who has spent years in a large clinic and as a teacher, Bassler's book is a complete work on the subject. MANZER.

A TEXTBOOK OF PHARMACOLOGY AND THERAPEUTICS, or the Action of Drugs in Health and Disease. By Arthur R. Cushny, M.A., M.D., LL.D., F.R.S., Late Professor of Materia Medica and Pharmacology in the University of Edinburgh. Ninth Edition, Thoroughly Revised by C. W. Edmunds, A.B., M.D., Professor of Materia Medica and Therapeutics in the University of Michigan, Ann Arbor, Mich., and J. A. Gunn, M.A., M.D., D.Sc., Professor of Pharmacology in the University of Oxford, Oxford, England. Illustrated with 73 Engravings. 743 pp. $6.00. Lea & Febiger, Philadelphia and New York, 1928.

The distinguished author of this well known textbook has died since the publication of the eighth edition. The present revision has been prepared under the supervision of Edmunds, of the United States and Gunn of England, the portions supervised by each being indicated in the table of contents. The immediate object of this edition is to bring it into line with the tenth edition of the United States Pharmacopeia. At the same time the subject matter has been brought up to date.

In this volume are included the latest drugs, as well as the standards of past years. There is a discussion of insulin, the vitamins, the role of cod-liver oil, also of quinine, thyroid, strychnine, pituitary, etc. Part I discusses substances which are characterized chiefly by their local action, Part II, substances characterized chiefly by their action after absorption, Part III, the heavy metals and metaloids. This is a handy volume for the physician's use, containing all necessary information on drugs without being so bulky as to be cumbersome.

ADDRESSES ON SURGICAL SUBJECTS. By Sir Berkeley Moynihan, Bart., President of the Royal College of Surgeons of England. Octavo of 348 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $6.00 net.

To those who have enjoyed the literary and scientific contributions of Professor Moynihan little need be said of the present volume of addresses. It is a collection of his writings which have appeared in various British and American journals during the last three years. To view them purely as a recitation of surgical events on the teachings of a professor of medicine would be to lose their greatest charm. And he himself, says, "they embody the faith of one who has spent his life in surgery, a faith which unwaveringly holds that there is no finer craft, nor any more sacred mission than the

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practice of our art. They seek to show that even supreme excellence in our art is not enough; that surgery is also the most powerful weapon of research ever placed in the hands of man for his own welfare. The art of surgery made perfect is the handmaid of its science." The pleasure derived from perusal of this volume is twofold; one from the delightful literary presentation, the other from the knowledge of the progress of surgery is expounded by a master of the craft. FORBES.

BACTERIOLOGY FOR NURSES. By Charles F. Carter, B.S., M.D., Director, Terrell-Carter Laboratory, Dallas, Texas, etc. Illustrated. 213 pp. $2.25. The C. V. Mosby Co., St. Louis, 1928.

The author states that the purpose of this little volume is to prepare a treatise, the subject matter of which shall be presented in accordance with the outline prepared by the Committee on Education of the National League of Nursing Education as a part of their model curriculum. In carrying out this purpose the thirty-nine chapters of the book contain concise and clear descriptions of the essentials of bacteriology. There are chapters on the exanthemata and other diseases of bacteriologic origin. This is a useful book in the education of the nurse.

DIABETIC MANUAL FOR PATIENTS. By Henry J. John, M.A., M.D., F.A.C.P., Maj. M.R.C., Director of the Diabetic Department and Laboratories of the Cleveland Clinic. 202 pp. $2.00. The C. V. Mosby Company, St. Louis, 1928.

This manual has been written for the diabetic patient in the hope that it will aid him in successfully combating his disease. The author explains what is diabetes, with chapters on blood sugar and urine sugar, and offers discussions concerning treatment before and after the discovery of insulin. Diet is presented in its various aspects and in a manner intelligible to the patients. There are numerous illustrations, tables and graphs on many phases of the disease, all of which will entertain and instruct the patient.

GYNECOLOGY. By William P. Graves, M. D., Professor of Gynecology at Harvard Medical School. Fourth Edition, Thoroughly Revised. Octavo Volume of 1016 pages, with 562 illustrations, 128 in colors, Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $10.50 net.

This edition his been completely revised from cover to cover. The revision has been necessary in view of the rapid advance that has been made during the past five years, in gynecologic science. Such subjects as the physiology of menstruation and ovulation, endocrinology and organotherapy have been for the most part entirely rewritten. A new classification of ovarian tumors with the most recent theories of their histogenesis is included. A new chapter details the present knowledge of cancer etiology and its practical application to pelvic cancer, the radium treatment of cervical cancer based on the work of the French school, the relation of gynatresia to cancer, the theory and practice of the lead treatment of cancer, and similar topics. The entire subject of sterility has been rewritten in order to meet the newest ideas of etiology and treatment. The entire edition is replete with the latest advance in gynecology, and the student, practitioner and specialist will find the volume a decided addition to his gynecologic armamentarium. C. D. SHANNON.

RULES FOR RECOVERY FROM PULMONARY TUBERCULOSIS. A Layman's Handbook of Treatment. By Lawrason Brown, M.D. Fifth Edition, Thoroughly Revised. 244 pp. $1.50. Lea & Febiger, Philadelphia and New York, 1928.

This book is not intended for physicians, but for the patients afflicted with tuberculosis. The author states that it should not be hastily read and laid aside like the modern novel, but should be gone over slowly, page by page, day by day, whereby important and practical facts will be discovered. He attempts to make clear the reasons for many rules ordinarily given to tuberculous patients. There are clear and useful discussions on the every day problems of this disease, presented in chapters on rest, food, fresh air, exercise, recreation and many other subjects which continually are presented to the patient. Any one afflicted with this widely prevalent disease will be benefited by reading this book.

HUGHES' PRACTICE OF MEDICINE. By R. J. E. Scott, M.A., B.C.L., M.D. Formerly Attending Physician to the Demilt Dispensary of New York. Fourteenth Edition. With 63 Illustrations, 839 pp. $4.00. P. Blakiston's Son & Co., Philadelphia, 1928.

This edition of this well known monograph contains new articles on tularemia, actinomycosis, yaws, visceroptosis and dementia praecox; also much new material appears on a large number of subjects. The arrangement of topics is convenient for reference. Under specific infectious diseases are chapters on diseases due to bacteria, protozoa, metazoa and unknown etiology. A similar arrangement is found under diseases of the digestive, circulatory, respiratory and nervous symptoms. Each disease presents the essential features under symptoms, diagnosis, prognosis and treatment. This is a handy desk volume for ready reference.

THE MEDICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume XII, No. 1 (Chicago Number, July, 1928). Octavo of 290 pages with 55 illustrations. Per Clinic Year, July 1928 to May 1929. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

Many interesting medical conditions are discussed in this volume. Williamson reports two cases of primary carcinoma of the lung, each presenting the usual baffling group of symptoms which render the diagnosis so uncertain in this condition. Each was correctly diagnosed, as proven by autopsy. Numerous valuable suggestions appear relative to the symptoms and diagnosis in this unusual condition. Pollock discusses phobias and neurology of the viscera. Curious incidents are related of phobias relative to imaginary intestinal conditions, the treatment being chiefly psychologic in character. Clinical reports appear of several diseases of children which are worth while reading. Many other valuable discussions are presented on various medical topics.

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The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ADDRESSES

THE DEFENSE FUND*

RICHARD J. O'SHEA, M.D.
SEATTLE, WASH.

I am going to confine what I have to say on this occasion to the subject of the defense fund. I do this for two reasons: First, because of its importance, and second, because there are so many practicing in the state who are unfamiliar with it.

The Defense Fund had its inception in the very few multipolar cells contained in the brain of Curtis Thompson, and was put into effect as a part of this association in 1911. The necessity for it was that all of the old line insurance companies withdrew from defense insurance. This was due to so many suits against the doctors at that time. It was almost epidemic for, with the legal ambulance chasers and medical men eager and ready to bear false witness against their neighbors, the court calendars were jammed with suits against medical men.

When the defense department of this Association was first established, the yearly dues for membership were five dollars. This had to be increased to ten dollars after the third year and has remained that ever since. Today, as the audit will show, this Association has assets totaling $21,902 and of this amount the Defense Fund has $13,335.91. The total membership in good standing is 1156, with probably not more than 250 in the state who have not at some time been members.

The Defense Fund now has a membership of 504 which is nearly one half the membership of the Association, an increase of 160 over the previous year. We have defended fourteen cases in court during the year and we have about forty-five additional which are threatened.

I do not know how many within these walls have been in court to defend a damage suit. I can see some, however, and they will "tell the world" in no faltering way that their membership in the Defense Fund was a source of great comfort during their trial and trouble.

This state is increasing rapidly in population and the number of medical men must also keep pace with the changing tide. This brings more risk of malpractice cases and this we find to be true—such cases are increasing.

Experience shows that 90 per cent of the claims made for malpractice are due to suit on the part of the physician or surgeon after he has obtained a bad result. This is outside of those suits brought to collect a bill, where a cross-complaint is brought in order to avoid payment. And speaking of this, I am inclined to believe that we should be slow to institute suit for the collection of a bill for two reasons: First, a patient whom it is necessary to sue for the collection of a bill is usually judgment-proof and you get nothing; second, the likelihood of a cross-complaint, as referred to before, to avoid payment. You lose if you win, as the case costs more to defend than the bill amounts to.

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*President's address delivered before the Thirty-ninth Annual Meeting of the Washington State Medical Association, Seattle, Wash., Aug. 27-30, 1928.

I cannot leave this subject without again cautioning all who hear me against unfavorable criticism of another's professional work. Oftentimes remarks are made thoughtlessly that lead to suits against another practitioner. Sometimes it has its cause in viciousness and jealousy. But no matter what the cause of the suit may be, it is always a nasty mess. During the past year several deplorable situations have resulted from the adverse criticism of fellow practitioners.

It is unfair always to criticise the method of treatment or skill of the practitioner from the end-results alone. You do not know the beginning or course of the injury or disease. I know of no line of endeavor, professional or business, when a penny-anti deal can be arranged between patient and doctor or lawyer and doctor to cause a suit for damage as in our calling. And this tendency exists notwithstanding our advanced knowledge does not decrease. The same old emotions exist—jealousy and spite brought on by rivalry and competition. Our medical societies, clubs and other associations fail to bring kindness and consideration for the other fellow.

I hope I have not spent too much time on this matter. If I have it is to the end that our profession may become more firmly united and bound by bands of graciousness so that suits for damage do not originate within our own ranks. However, experience shows that so long as mankind has existed we have had these things to contend with. So in order that we may stand off such damage suits, we have our Defense Fund at ten dollars a year to help and protect us.

It is well for you to know that membership in the State Association alone is not enough for membership in the Defense Fund. The committee having charge of it has the right to revoke or refuse an application. And this is a wise provision.

We have employed under agreement the best attorneys in the three sections of the state, selected because of their especial aptitude in damage cases. Our record of successful defense of our members under the guidance of the originator has been more than satisfactory. We have been able, as I have told you, to accumulate a surplus where most of the insurance companies show a deficit.

The official program of the thirty-ninth annual meeting is in your hands. The reports of the various standing committees are printed therein and await your comment.

PROBLEMS CONFRONTING US*

ALEXANDER BARCLAY, M.D.
COEUR D'ALENE, IDA.

Idaho is an immense state and means of easy communication within its boundaries are not present. I feel this is one of the reasons why it has been so difficult to have a really representative annual meeting in the past. Our sister states, Montana and Wyoming, no doubt have experienced the same difficulty.

In combining forces, as we have done this year, I feel that we have been able to furnish a program which, if attempted individually, would have been impossible. With the added attractions of this beautiful national park which have been so skillfully sandwiched into the program by our respective secretaries, it makes a combination which is altogether delightful, and it is my pleasure at this time to welcome you all to our meetings and to extend to you the glad hand of fellowship. It is my earnest wish that this meeting will be but the forerunner of many pleasant and profitable ones in the future.

As president of the Idaho State Medical Association it is my duty to deliver an address at our annual meeting, but I would much rather talk to you about a few of the problems which are just around the corner. However, that cannot be, as my message must go out to those who have not been able to leave their work and attend this meeting, and we have no stenographer here to take it down in shorthand.

Our first problem, as I see it from the inside, it that of cooperation within our ranks. In the past this has been rather half-hearted and this for two reasons. First, each man has been busy with his own problems and they concern him primarily. He has not had time nor inclination to drop his business and devote his efforts to the welfare of others, unless he can see where it is going to bring him some immediate return. Too many physicians are "lone wolves." They view their competitors askance and are too apt to believe what every lying patient tells them the other fellow said. Remember that this same patient, who has no loyalty to you, will desert you upon presentation of your bill to return to the other fellow and fill his ears with things you said about him, and so it goes. Much of this sort of trouble can be averted, if the various county societies will get together often at the homes of the different members, get their feet under the table for a good feed and then spend the evening in social intercourse. A few meetings of this kind will break down many barriers and you will find that the other fellow is quite a chap after all. Make it your business to see that he sees something in you also, and much stiffness and professional jealousy will be absent at your next consultation.

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* President's Address, read before the Thirty-sixth Annual Meeting of Idaho State Medical Association, at the Tristate Meeting of Idaho, Montana and Wyoming State Associations, Yellowstone Park, Wyo., August 27-29, 1928.

The second reason why our cooperation has been half-hearted is that our State Medical Association has concerned itself largely with scientific matters and has focused this attention upon the annual meeting which is attended by a minority of the members, as a rule. It has been easy to belong to the association, a membership in a county society and the payment of nominal annual dues being all that was necessary. This automatically carried a membership in the A. M. A. and the average member was content with all this glory, being satisfied to let the officers of the association do all the necessary work.

In the past, until the last few years, this has been sufficient for our needs but now we are in the midst of changing conditions and the old order will not suffice. The legal profession examines its applicants to the profession through the state bar association, to which every attorney is practically forced to belong, and in their hands lies the power to revoke licenses of members found guilty of unethical, reprehensible or illegal practices. Contrast this condition with that which faces the medical profession, when it wishes to clean house and present a clear eye and unflushed countenance to the world.

Judging from the experience of my own town, I do not hesitate to say that there are hundreds of abortions being performed every month in our state, yet it has been a long time since I have heard of a single medical license being revoked for this cause and the reason is not hard to find. A man may be as guilty as hell and hundreds know it, but no move is made to stop the wholesale murder of innocent and defenseless babies. To convict a man of criminal abortion someone, usually a physician who has the facts, must swear out a complaint to the Department of Law Enforcement which then takes the matter up to the county attorney and he brings the action. A trial is held and the jury, composed many times of men who have had the accused physician perform abortions for their wives, listens to the evidence, goes into solemn conclave and brings in a verdict of innocent. The physician who has brought the charge is damned, the guilty scoundrel is lauded to the skies and gets a lot of free advertising which brings in more of the same kind of business.

I suggest to the Legislative Committee that here lies a fruitful field for their endeavor during the next session of the legislature. Let us have the medical practice act changed so that the medical profession control entry into its ranks, and let it be given the power to expel from its midst those unworthy members who cast shame upon the hundreds of decent physicians who must suffer willy-nilly by their acts.

Some nine or ten years ago the legislature authorized the formation of a Workmen's Industrial Accident Board and delegated powers to them which it did not dare to assume itself. As a result you have a board composed of laymen, appointed by the governor, which has power to say when, how and where you shall treat the patients who come to you voluntarily for help and which also tells you what you may or may not charge for your services, usually allowing you no leeway in the matter.

Have you heard of any other profession which has had a board appointed with power to regulate its charges and which can say how, when and where its members shall practice their profession? I am informed, from what I consider a reliable source, that at one time this board, secure in a belief in general medical apathy, contemplated passing a rule which has the effect of law, that any physician could have his license revoked who refused to treat an industrial accident because of the low fees paid.

Some of you may say "this does not affect me as I do little or no industrial work," but do not be too sure. It is only a step from this stand to another which would make the rule apply generally, in other words, state medicine and when this happens, good bye to all initiative and individuality, spring the trap, the toboggan is off! I am no alarmist and I think I do not see things before their shadow at least appears and, while shadows themselves amount to nothing, the thing which casts the shadow may be of evil portent; it is those things of evil for our profession which I am warning you against, and whose shadows even now fall across our path.

Consider the high-average physician, the general practitioner of today, and compare him with the average specialist of twenty-five years ago. There is but little to choose between them with the balance, perhaps, in favor of the modern man. Compare the general practitioner of 1900 with the man of 1928. The older man had as his chief competition the homeopath, the street corner fakir, Lydia Pinkham and Dr. Pierce. The homeos have almost disappeared but the others are still with us, augmented by osteopaths, chiroquacks, sanipaths, electronic reactions, scientific christians (God save the mark) and electric horse collars, most of which have some standing in law and all of which have some influence on the doctor's income.

As the president of your association, I wish I were able to be, as our constitution requires, "the real head of the profession in the State during his term of office," but this would require me to attend the sessions of the legislature and every committee meeting dealing with problems which concern the medical profession. I would have to be on the job day and night at my own expense to guard your interests and protect your welfare, while my own personal business was going to the quacks. Of course, I am not going to do this, I cannot afford it, and who among us can? I have shown you where we have lost out in the past through lack of cooperation, and real dangers threaten us in the future.

I am reliably informed that one of our legislators has already been approached and offered, well, I am not at liberty to say how much exactly, but several thousand dollars by one of the irregular cults to fight their battles for them at the coming session of the legislature. This man is an honorable gentleman and has turned them down, but they are not abashed in the least. They will find someone who will do this work for them and they will see that he earns his money. Keep your eyes open and you may discover him for yourselves.

If we are going to stand by and see our profession descend from its lofty place in the councils of men and degenerate into minions of a bureau composed of intellectual inferiors, often arbitrary and despotic in abuse of their power, if we are going to allow ignorant and vicious nobodies to shape legislation which widens their scope of activity and limits our own, and this without a protest from us until it is too late, then this outburst will awaken no feeling of pride in your hearts. If, on the contrary, you feel with me that it is high time that we attended to our business in a business-like way, you will not begrudge the increased fees you have paid this year for your membership.

It is the function of the councillors to attend to the business affairs of our organization but for this they receive no pay; they have their ears to the ground and they know what is going on. Last year they hired a man to attend to these business affairs for us and they chose him after due deliberation for several qualifications, all of which he possesses. I refer to Paul Davis. First, for his loyalty to the medical profession, and this is fundamental and vital; second, for his acquaintance throughout the state which is remarkable, and the value of this is evident, when I tell you that he was offered $1000 a month by a political organization to work in their interests, which offer I have advised him to accept; third, for his knowledge of medical law, his genius for unerringly picking out the flaws in proposed legislation inimical to our interests and his utter fearlessness and bulldog determination in standing for the right in our behalf. Consider these qualifications, so necessary and useful to us, and you will not be surprised to hear that he has enemies, even among the profession.

He, in common with us all, has his faults and I am well aware of them. Even the "perfect ass" is imperfect, but in spite of them all his friends are legion in every city of the state and I am glad to be numbered among them.

Your two past-presidents have pointed out to you the necessity of a basic-science law in Idaho, but nothing much has been done about it, due to our lack of proper organization. You may be sure that this is one law that the cultists will never foster and support. We now have an organization which is competent to draw this bill and to have it offered at the next session of the legislature. The matter will be presented to the house of delegates in due time and action taken in that body. You may confidently expect action in Boise next winter.

I wish to call your attention to the activities of the State Antituberculosis Association during the past year. Through its secretary, Mrs. Catherine Athey of Boise, it has cooperated with our association and has held clinics conducted by its local officers and county medical societies in various parts of the state. These clinics were conducted by Dr. Allen Hart, a chest specialist of large experience, employed by the Antituberculosis Association at no expense to the patients. The suspects were supplied by the various physicians from their own practices and a liberal amount of x-ray work done whenever needed. Many cases of incipient tuberculosis were discovered and undoubtedly many lives saved through timely intervention. This lay association is certainly doing good work and is beginning to reach its stride. I recommend it to you as being worthy of vigorous support when the time again arrives in which it applies to the legislature for funds with which to build a state hospital for tuberculosis. Let us hope that this time is not far distant.

Along this line I would call to your attention the value of the periodic health examination, both from the material and altruistic standpoints. In early childhood we are subject to various afflictions which creep upon us like a thief in the night with but little or no warning until the damage is done. The cases of eye-strain and astigmatism, aggravated by the application to books from which the child was free until of school age, the postural defects, the enlarged and often diseased glands incident to increased lymphatic activity, the decayed and crooked teeth which affect the permanent teeth buds lying beneath, the undernourished child who becomes a fit subject for tuberculosis, these and others of which you are thinking can be detected in the periodic examination and their evils corrected before the child is disabled for life.

After forty we are subject to well defined disorders, the degenerative changes begin to make their appearance and the kidneys, heart and liver, the prostate and uterus are usually the organs which claim our attention and an examination of which, made before much damage has been done, will mean increased years of activity for the patient, for which he may or may not be grateful. Our business office has sent out thousands of pamphlets to physicians describing the value of the periodic examination for them to enclose in their statements to their patients. It adds a little personal touch and does no harm; it is pregnant with great possibilities.

Lack of time prevents me from covering the ground I would like to cover. We have a very full program of excellent material upon whose time I hesitate to infringe. However, I will hastily summarize and finish. First, I ask for whole-hearted cooperation with your officers during the coming year. They are devoting a great deal of their time to your problems and welfare with no personal gain in view. They may make mistakes and probably will, but they will be minor ones and the balance will be all in your favor. Trust them and give them your support; it is all you have to give them and they will ask for nothing more. Get out and attend your society meetings. Put something of yourself into them and then, if you are not satisfied with the result, you have someone besides the other fellow to blame. An occasional social meeting is one of the best lubricants. If you are called upon by your officers to devote some time in seeing and talking to your state senator or representative concerning some pending legislation, do not draw into your shell and say, "I despise politics, I do not think we should get into them." You may be right in what you say but you are in politics already, whether you like it or not and, if you do not present your side when opportunity offers, you may be sure that the other fellow will and he is making an effort to tie your hands and take the bread from your mouth. If you do not believe that, I know what I am talking about; make some independent investigations yourself and be convinced. Don't believe all the stuff you hear from patients concerning what the other fellow has said about you. A few chance words may be garbled out of all recognition and the probabilities are he is too busy with his own affairs to spend much time in remedying yours. Next time you have the opportunity, do him a good turn and watch his reaction.

Get behind the Antituberculosis Association and their wonderful work. It may eventually prevent many terminal tuberculosis cases which might otherwise require your services, but you will never know it and will not miss their problematical fees. Use the various services which your business office in Boise has to offer: pamphlets concerning health regulation, periodic examinations, collection service including disputed claims against the state fund, although I am happy to state that these are very much less under the new manager; printing, stationery and the many other aids which are yours for the asking.

In closing, I wish to tell you how much I appreciate the honor you have conferred upon me in choosing me to head your organization this past year. I have had some wonderful support at critical times and often from sources least expected. With the increased fees and employment of a business manager, all has not been "beer and skittles," but we now have well over one hundred and eighty actively interested members, against some two hundred and twenty odd the previous year, and this is considerably more than a sanguine estimate made at that time. We are entering upon a new era, a glorious future beckons with no uncertain hand, the way is strewn with stumbling blocks and the going will not be easy, but I believe we have seen the light and with courage and determination we will press on and regain the esteem of decent men and women. Pray God we will not falter.

ORIGINAL CONTRIBUTIONS

UNUSUAL FORMS OF OSTEOMYELITIS*

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Osteomyelitis usually produces relatively constant pathologic and clinical features that make the disease fairly easy of recognition. The clinical picture both local and general is that of an acute pyogenic infection and the pathologic process that of a suppurative inflammation, beginning in the metaphysis and affecting more or less diffusely the diaphysis of the bone. The organism is the staphylococcus in the great majority of cases.

Unusual forms or features of osteomyelitis may be attributable to a variety of factors, as age, type and virulence of the microorganism, the bone affected, and the seat of involvement of a particular bone.

In the great majority of cases osteomyelitis begins in childhood, but it may develop in young infants, and in about five per cent of the cases it begins in adult life. There may be unusual portals of entry for the microorganisms, as the infected cord in the infant or the skin eruptions in smallpox. While the usual known portal of entry is a skin lesion, as a boil or wound, in the majority of cases the point of entrance remains unknown. It is generally considered that the organisms enter the blood stream in such cases through the nasopharynx or mouth, but this is largely conjecture. Pimples and trifling wounds of the skin which go unnoticed are more likely portals. With the exception of typhoid fever, it is exceedingly rare that a known lesion of the stomach or intestines is complicated by osteomyelitis. I have never seen it develop from appendicitis or cholecystitis. Biesenberger records a case of osteomyelitis complicating a liver abscess, following resection of a duodenal ulcer. An interesting fact is that osteomyelitis complicating typhoid fever has been found by Winslow to be due to the colon bacillus in a small percentage of cases.

The bone may occasionally become involved by direct extension of infection from the accessory nasal sinuses or middle ear (fig. 1). Diffuse osteomyelitis in adults may result by direct extension or infection from a neighboring joint. Thus I have twice seen extensive osteomyelitis of the tibia develop secondary to arthritis of the knee produced by a stab wound without injury to the tibia (fig. 2).

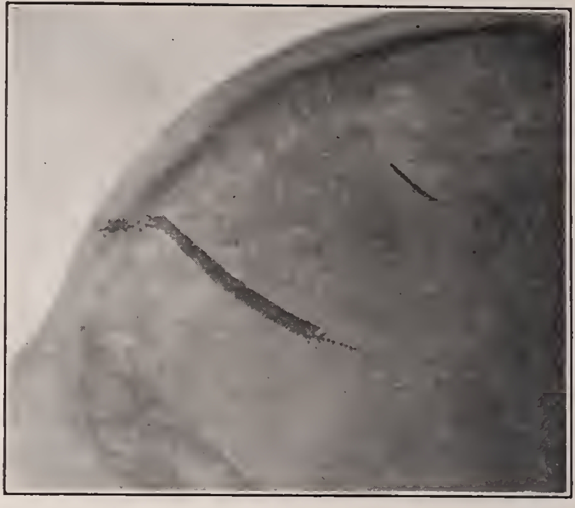
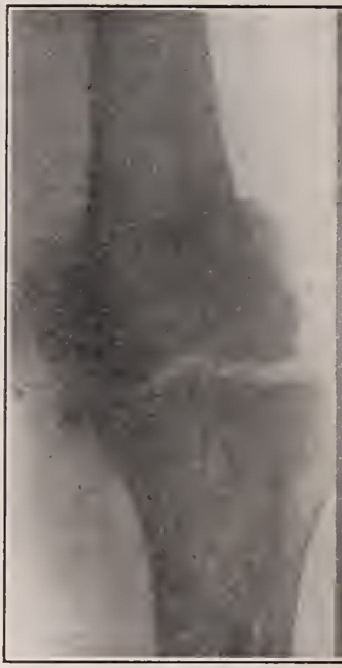


Fig. 1. Osteomyelitis of frontal bone by direct extension from frontal sinusitis.



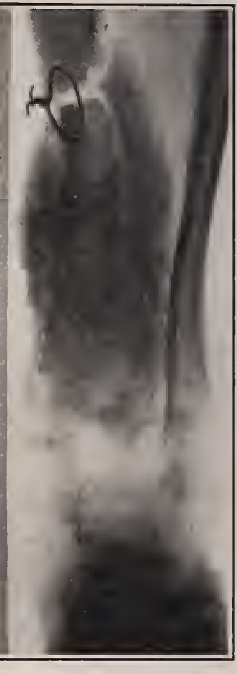


Fig. 2. Osteomyelitis of tibia and femur arising from suppurative arthritis following stab wound of knee joint.

Fig. 3. Diffuse osteomyelitis of lower fragment in compound fracture of tibia. Entire shaft of fragment found dead and sequestrated at operation.

In amputations or open fractures, infection of the bone is usually localized, not more than one inch of the ends of the fragments being involved. But there are unusual instances, in which diffuse osteomyelitis develops in one of the fragments, and spreads for a long distance in the shaft, as shown in fig. 3.

Staphylococci are responsible for at least ninety per cent of hematogenous bone infections; consequently infection by any of the other pyogenic organisms constitutes an unusual form of osteomyelitis. With the exception of the streptococcus these organisms usually produce a mild and somewhat localized infection which clinically resembles that caused by the staphylococcus. The hemolytic streptococcus may produce diffuse osteomyelitis with much pus, but usually the exudate, as in streptococcus infections in general, is smaller in amount and less purulent than that produced by the staphylococcus. The possible role of streptococci in the production of bone lesions characterized by marked absorption of bone, and the presence of absorptive cells and a serous exudate, i.e., solitary bone cysts, will be discussed later under the headings of localized osteomyelitis and bone cyst.

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*From the Department of Surgery, the University of Chicago.

*Read before the Seventh Annual Meeting of Pacific Northwest Medical Association, Tacoma, Wash., July 5-7, 1928.

The seats of infection in bone during the growing period are closely related to the rate of growth of the different bones, and of the different portions of a single bone. In general, the more rapid the growth, the greater the liability to infection. Growth is most rapid at the metaphysis, which is the most frequent seat of osteomyelitis. Metaphyses which grow more rapidly than others, whether in the same bone or in different bones, are in general more prone to infection. Thus, if we consider the skeleton as a whole, the longer the bone, the greater the incidence of osteomyelitis. The ribs are a notable exception to this statement, being involved only three times in three hundred and twenty cases. Figure 4 shows osteomyelitis of the ninth rib with the unusual condition of an abscess between ribs and pleura of six weeks standing and no external swelling.

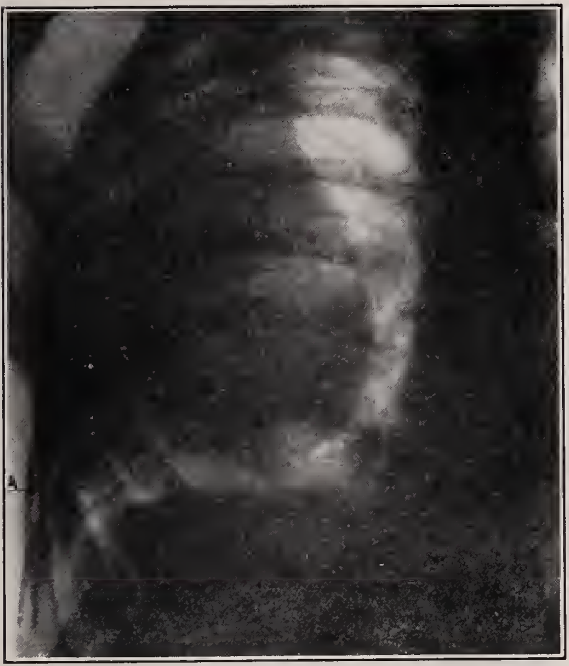

Fig. 4. Six weeks old osteomyelitis of 9th rib, (a) with abscess between ribs and parietal pleura.

Also the greater the diameter of the bone, the greater the incidence of infection. Thus the diaphyses of tibia and fibula are approximately the same length, but the tibia is involved one hundred and one times to twenty-three for the fibula. Hematogenous infection of short diaphyses, as the phalanges, metacarpals and metatarsals, is uncommon, the metacarpals and metatarsals being most frequently affected. The carpal bones are exceedingly rarely infected. However, the tarsal bones are much more commonly involved, particularly the os calcis and astragalus.

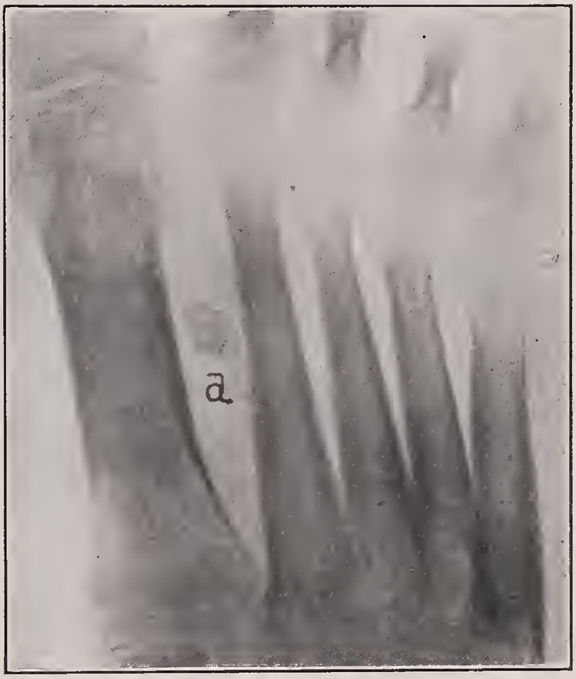

Fig. 5. Osteomyelitis of lateral sesamoid of great toe with proximal migration of sequestrated bone.

A rare lesion is osteomyelitis of a sesamoid bone. I have seen one example, namely osteomyelitis of the external sesamoid bone of the great toe which resulted in complete necrosis and displacement of the bone as shown in figure 5. This was in a twenty-year old man with multiple osteomyelitic foci, in whom the patella, which is really a large sesamoid, was also involved.

The rate of growth of the centers of ossification in all of the epiphyses is slow. Those which are relatively large appear early and grow until late, while those which are relatively small usually appear late in childhood and ossify relatively soon after their appearance. Primary pyogenic infection of the epiphysis, or epiphysitis, is exceedingly rare during the period of growth. On the other hand, infection starts in the epiphysis occasionally in adult life. Extension of infection across the epiphyseal line from osteomyelitis of the shaft with involvement of the center of ossification in the epiphysis is rare in childhood, while the cartilagenous portion of the epiphysis is extensive and the bone center is relatively small. The epiphyseal cartilage may be perforated and the bone involved without arrestment of longitudinal growth of the shaft. On the other hand, there may be fusion of bone in the epiphysis and metaphysis with arrested longitudinal growth.

The reason for the exceeding rarity with which the growing epiphysis is primarily infected is probably the slow rate at which it ossifies. It is also related to the fact that the branching arteries carrying the blood to the periphery of the center of ossification are not end arteries but communicate with each other, as shown by Nussbaum. On the other hand, the metaphyseal arteries carrying the blood to the growing juxtaepiphyseal regions of the metaphysis are end arteries. Bacteria lodging in them are much more likely to produce infection than when they lodge in the vessels of the epiphysis.

SCLEROSING OSTEOMYELITIS

Diffuse osteomyelitis usually produces extensive necrosis of the cancellous bone in the region where it starts and of cortex of the overlying regions and for variable distances beyond. Later on there is sequestration and a variable amount of absorption of the dead bone, and new bone formation producing the well known picture of sequestrum and involucrum. There are exceptional cases in which infection spreads more or less diffusely in a large segment of bone without producing necrosis en masse, but with the production of extensive new bone. This results in the picture of diffuse sclerosing osteomyelitis. In many of the cases of long standing osteomyelitis, particularly in the young there was extensive death of bone at the onset but the lesion was not treated properly in that drainage and sequestrectomy were not performed. The result was that dead bone was gradually absorbed and its space occupied by new bone. However, small cavities are likely to persist in the interior of such bone which remains chronically infected. Recurrent osteomyelitis is nearly always a localized process but occasionally the recurring infection will spread diffusely in much of the old sclerosed bone.

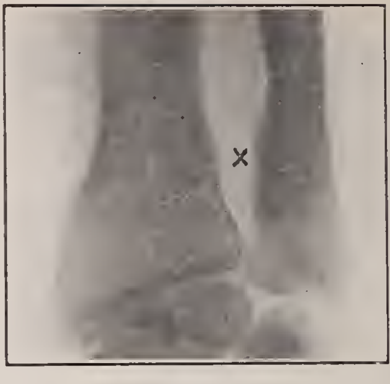

Fig. 6. Sclerosing osteoperistitis of lower end of ulna with extension of radius (x).

There may be more or less extensive infection along the surface of a bone without bone destruction, producing the picture of sclerosing periostitis or osteoperiostitis. When one bone of the forearm or leg is involved on the neighboring side, the other bone may show similar involvement at the same level (fig. 6). These cases may be hard to tell from other inflammatory processes, particularly lues. Chronic inflammatory processes in overlying soft parts, as leg ulcers, may rarely produce marked and extensive sclerosing periostitis.

Sclerosing osteomyelitis and periostitis usually produce fairly constant symptoms. The onset may be acute with pain and disability, followed by a chronic course with pain and swelling of the affected region. In many cases the disease is chronic from the outset and is characterized by a dull pain most marked at night which varies more or less in severity. These same symptoms may be seen in sclerosing osteomyelitis which persists in the remaining walls after extensive operation for the ordinary osteomyelitis. All forms of sclerosing osteomyelitis are as a rule relieved by wide excision of bone in the most extensively involved regions. Granulation tissue and exudates are frequently not found in the excised bone but the relief after operation is usually very striking.

LOCALIZED OSTEOMYLELITIS

Perhaps the most unusual variations in pyogenic infections of bone are seen in connection with localized osteomyelitis. That form is most frequently confined to the metaphysis of a long bone. It begins acutely with fever and localized pain and swelling. There is rapid absorption of an area of cancellous bone with the formation of a cavity which is filled with pus. A variable amount of new bone is formed about it. If such an abscess is large, it may rupture to the outside, but if small it usually remains closed and passes into a chronic stage. Sclerosis of the surrounding bone usually becomes more marked, and the pus may be gradually absorbed and replaced by granulation tissue. Periodical exacerbations of the infection are common, at which time the granulation tissue may again be broken down and the cavity filled with pus. Localized abscesses of similar character may be left in the field of diffuse osteomyelitis that has been treated improperly.

Acute localized osteomyelitis usually makes definite local symptoms of pain, tenderness and swelling. But there are many instances in which the local symptoms are mild, particularly when the lesion has developed secondary to a more severe and diffuse osteomyelitis. In unusual cases localized osteomyelitis may occur without producing any local symptoms whatsoever. A local swelling may appear without pain and may show little tenderness on palpation. Such areas have been referred to as silent foci of osteomyelitis. They may persist for months without producing symptoms but usually there is exacerbation of the infection and finally the development of local pain and tenderness. Operation is necessary for the eradication of all of these foci, the symptomless ones included.

All forms of localized osteomyelitis, revealing an area of reduced density, are in the class commonly referred to as Brodie's abscess. This is a loose term and should be discarded, as it usually conveys a false conception of the nature of the lesions. Careful consideration of their pathology reveals the fact that many of them contain pus only at the onset and even then it may be small in amount. In the subacute and chronic stages the cavity is often filled entirely by granulation tissue or connective tissue in varying stages of maturation. Occasionally the old cavity is found to be filled with mature scar tissue, and spongy bone may be replacing it about the periphery.

NONSUPPURATIVE OR FIBROUS OSTEITIS

Fibrous osteitis is a term that is frequently used but it has not as yet acquired a specific meaning. In general it implies an inflammatory process in bone, characterized by marked production of fibroblasts and bone absorption with little or no infiltration by leucocytes and with a variable but usually a small amount of exudation. It has been extended by some to include certain forms of localized osteomyelitis, bone cysts (osteitis fibrosis cystica), and even benign giant cell tumors. Bacteriologic investigation of these lesions has yielded positive findings in some of the cases of localized fibrous osteomyelitis and bone cysts, but as yet bacteria have not been demonstrated in benign giant cell tumors with sufficient certainty and regularity to justify one in regarding them as the existing cause.

Localized fibrous osteomyelitis is a subacute or chronic disease, in which bone is absorbed by the action of tissue composed of fibroblasts and new blood vessels, without any appreciable amount of accompanying new bone formation. This leads to the formation of a defect or cavity, inasmuch as the inflammatory tissue does not accumulate in large amounts. I have seen occasional examples of this form of inflammation, in which cortical and medullary bone are broken down, leaving irregular worm eaten surfaces with extremely little fleshy tissue filling out the defect. The following case is a good example.

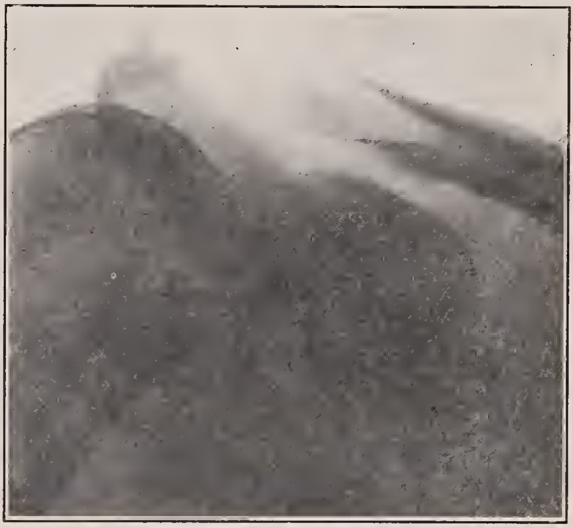

Fig. 7. Fibrous osteomyelitis of acromion process of scapula.

Woman, age 30, had had a dull pain in the region of the left acromion process for six months. It was aggravated on two occasions by excessive lifting. There had been limitation of abduction and elevation of the arm for three months. Physical examination was negative aside from the left shoulder region. There was slight limitation of abduction and tenderness on pressure over the acromion, bordering on the left acromioclavicular joint. No swelling. A roentgenogram (fig. 7) revealed extensive erosion of the acromion process bordering on the joint, but no new bone formation.

Operation revealed destruction of bone in the acromion along the joint to a depth of 1 c.c. There was no exudate and only a thin layer of grayish tissue covering portions of the eroded surface. The ligaments of the joint were partly destroyed and elongated. The involved bone was removed with a rongeur forceps.

Microscopic examination of the excised fragments showed active absorption of bone produced by fibroblasts and occasional giant cells. The newly formed tissue was fairly vascular and contained very few leucocytes (fig. 8). The picture is that of caries. There was a small amount of necrosis of the absorbing tissue but no old hemorrhage. Bacteriologic examination yielded staphylococcus aureus.

There are other obscure forms of localized destructive osteomyelitis without new bone formation, in which fibroblasts, giant cells and special types of leucocytes predominate. The lesions develop rather silently, and are often seen in the skull, where they may destroy its entire thickness over an area of an inch or more in diameter. The radiogram shows a punched out area of bone destruction. Sometimes there is a local swelling which is either painless or slightly tender. Exploration reveals the cavity filled with soft tissue and microscopic examination shows it to be composed of fibroblasts, a few giant cells, and in some cases of very large numbers of eosinophiles. In other cases there are no leucocytes, and extravasated blood may be present which gives the picture of a lesion described in the next group. These lesions have frequently been mistaken for tumors and have been classed as myelomas. The process is usually confined to one or two areas of destruction and healing usually follows promptly after operative removal of the diseased tissue.

CHRONIC HEMORRHAGIC OSTEOMYELITIS

I wish to call attention to a group of chronic nonsuppurative localized inflammations of bone which are characterized by such special pathologic and clinical features as to warrant separate consideration. The lesion may be situated subperiosteally or endosteally or in the cancellous bone of the end of the shaft. It pursues a subacute or chronic course and produces a relatively small circumscribed area of bone destruction with a variable amount of surrounding new bone formation. The cavity is filled with soft tissue which varies in color from dark brown to gray according to the age or activity of the disease. The brownish color is due to the extravasated blood and blood pigment. In some cases the tissue is an intense brown; in other cases it is a mixture of brown and gray, while in others it is gray. Microscopic examination shows it to be composed of fibroblasts in various stages of maturation, old blood and blood pigment, foreign body giant cells in varying numbers, and occasionally there are newly formed bony trabeculae. Leucocytes and lymphocytes are rare and there is no exudate present. In some cases the fibroblasts are young and the giant cells numerous, and with the pigmentation the tissue can scarcely be differentiated from giant cell tumor. Konjetzny has applied the term "brown tumor" to this type of tissue.

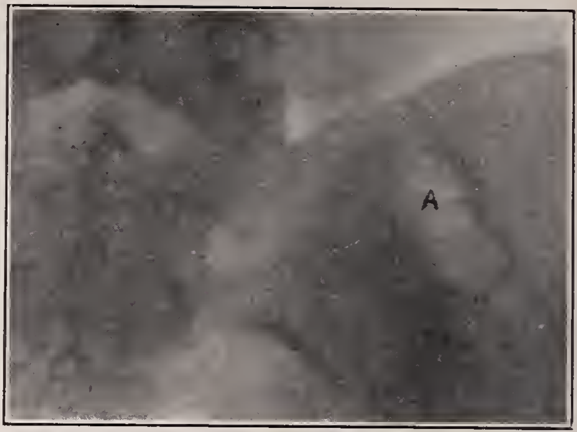

Fig. 9. Localized hemorrhagic osteomyelitis of left ilium with bony shell about cavity (a).

In some of the lesions the tissue is organizing and consists to a considerable extent of white fibrous connective tissue with little pigment and few or no giant cells. In other cases it consists almost entirely of white fibrous connective tissue. Occasionally there is a small amount of ossification in the soft tissue. Sclerosis of the surrounding bone when limited leads to the development of a comparatively thin shell of bone about the cavity. In other cases the surrounding new bone formation is very marked, especially when the lesion is located subperiosteally or endosteally and the presence of a central cavity may not be detectable in the radiogram. The cavity may be detected only at operation.

The lesion produces a fairly constant clinical course which is that of localized chronic osteomyelitis. The symptoms are pain and tenderness which are mild at the onset and gradually become more severe. Constitutional symptoms are either slight or absent. The lesion may make more or less continuous disturbance over a long period of time. If of the sclerosing type, the new bone gradually increases in amount, and when the lesion is situated about the periphery, an oval bony swelling appears. If it is centrally located the dense shadow may simulate that of a centrally located ossifying tumor.

I have had occasion to study seven cases belonging to this group. They respond readily to sloping removal of the overlying bone with excision or curretage of the bony cavity. Bacteriologic examination has been made in four cases with negative results in three. The staphylococcus aureus was found in one case. Despite the generally negative bacterial findings, the lesion has all the ear marks of

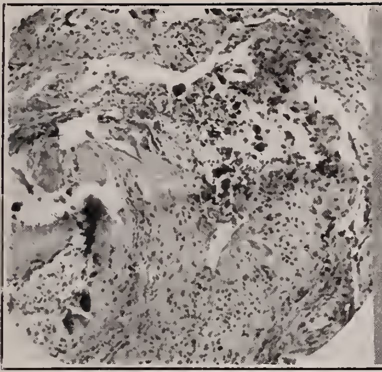

Fig. 8. Tissue from case shown in fig. 7.

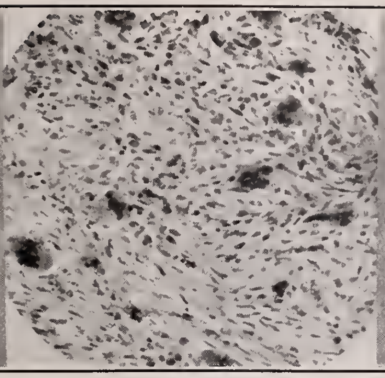

Fig. 10. Photomicrograph of tissue filling cavity shown in fig. 9. Giant cells, fibroblasts and blood pigment.

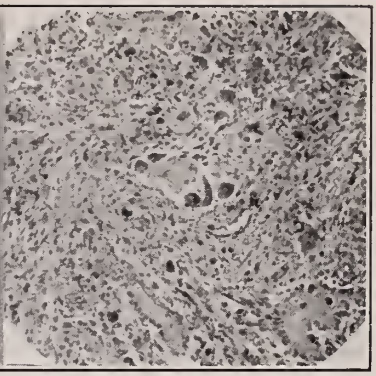

Fig. 12. Contents of cavity in center of sclerosed area of fig. 11, showing fibroblasts, giant cells, blood pigment and bony trabeculae.

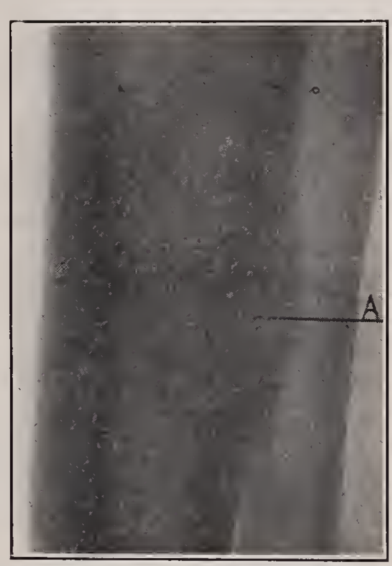

Fig. 11. Localized hemorrhagic osteomyelitis with faintly visible central cavity (a) and marked sclerosis about it.

an inflammatory process. In one case the lesion developed in the field of an osteomyelitis ten years previously which would speak for its infectious nature. These are apparently the same type of lesion which Pommer and Losser have regarded as due to hemorrhage into the bone, leading to absorption and fibrous and giant cell formation with the production of giant cell tumors. The following cases are illustrative, the first of the nonsclerosing, and the second of the sclerosing form.

Case 1. M. M., female, age 19, had an open wound on right shin for two months, during which time she developed pain in the left posterior iliac region which gradually increased in intensity and incapacitated her at intervals during the succeeding nine months. No general symptoms. Examination revealed slight tenderness over the left ilium posteriorly along sacroiliac joint; no swelling. A radiogram (fig. 9) revealed an oval cavity in the ilium near the joint with a narrow zone of sclerosis about it.

Operation showed a cavity lying just beneath the cortex posteriorly. It had a shell of cortical bone about it and was filled with a firm tissue which was mottled brown in about one-third of its extent and grayish in the rest. The cavity and its walls were excised. Microscopic examination of fibrous tissue showed fibroblasts, organizing connective tissue, pigment, and giant cells in the brown areas, and an immature white fibrous connective tissue in the gray areas (fig. 10). The operation resulted in complete relief.

Case 2. L., male, age 51, had had gradually increasing pains in the upper third of right tibia for one year and nine months. A hard oval swelling began two months after onset and has gradually increased in size. Radiograms, taken three, twelve, and twenty-one months from the onset, revealed a gradually increasing bony thickening on the mesial side of upper third of tibia. In the earlier pictures no reduction in density could be elicited but in the last picture there was a small area which was slightly reduced in density at the center of the lesion (fig. 11). Wassermann negative.

Sloping excision of the sclerosed bone and the cavity, the latter being about 0.7 cm. in diameter. On examination of the specimen the cavity was found to be filled with brownish soft tissue. Microscopic examination showed that it was composed of relatively young fibroblasts, blood pigment, giant cells and new bony trabeculae (fig. 12). Cultures were negative.

OSTEITIS FIBROSIS CYSTICA

Bone cysts may occur either as solitary lesions or as a part of the picture of multiple fibrocystic disease. The latter is a constitutional disturbance, in which the picture of osteomalacia or osteitis deformans coexists. Solitary bone cysts are seen mainly during the growing period, and there is central destruction in the metaphyseal region with more or less erosion of the overlying cortex. The tissue lining the cavity and eroding the walls consists mainly of fibroblasts and blood vessels but it contains varying numbers of giant cells and may contain infiltrative cells which give it an inflammatory character. In some instances the lining contains very few infiltrative cells and presents the typical picture of fibrous osteitis. In other cases eosinophiles, plasma cells and in rare cases even polymorphonuclear leucocytes may be fairly abundant.

There have been many theories advanced to explain these lesions. Pommer and Losser explain the process as follows: Traumatism produces infraction of the cortex of a growing bone, hemorrhage, stasis, absorption, necrosis and subsequent hemorrhage, and serous exudation terminating finally in cyst formation. Axhausen has advanced the theory that primary epiphyseal necroses are anemic infarcts, the result of vascular occlusions from either embolism or thrombosis of the epiphyseal vessels. Recently he has reported anemic infarction in the metaphyses and has attempted to explain epiphyseolysis capitis, "brown tumors" and solitary metaphyseal bone cysts as a result of it. These explanations of solitary bone cysts seem inadequate, and the most plausible theory is that some microorganism is the exciting factor.

Gordon and I reported two cases, in which a green producing streptococcus was found. Konjetzny reports greenish fluid in a bone cyst which may have been produced by streptococcus viridans. Others have reported the staphylococcus. It seems very probable that the lesions are the result of an infection by a microorganism of such virulence that it excites proliferation and absorptive activity on the part of the fibroblastic element of the bone with little or no leucocytic infiltration; in other words, that the disease is a true mycocytic fibrous osteitis.

Barrie regarded the lesion ordinarily designated as benign giant cell tumor as an infectious process which he called hemorrhagic osteomyelitis. He offered no bacteriologic evidence in support of his view. Konjetzny has attempted to explain solitary bone cysts, "brown tumors" and benign giant cell tumors as due to traumatism and hemorrhage in the bone followed by congestion, absorption, fibroblastic proliferation and giant cell formation. It is true that the pictures of osteitis fibrosis cystica and benign giant cell tumor overlap and that it is often difficult to know whether a lesion should be classified as giant cell tumor with degeneration and cyst formation or osteitis fibrosa cystica with a thick fleshy lining of the bone cavity. This may indicate an etiologic relationship. The evidence in favor of the infectious nature of bone cyst is greater than that for benign giant cell tumor, but as yet no entirely satisfactory explanation can be made of either lesion. The fact that sarcoma develops out of benign giant cell tumor in exceptional cases is evidence in favor of the view that the lesion is a benign neoplasm rather than an inflammatory process.

I. LABORATORY AND CLINICAL METHODS OF STUDYING THE HEART BEAT *

II. THE PHYSIOLOGIC BASIS FOR THE CLINICAL INTERPRETATION OF CARDIAC IRREGULARITIES *

III. THE PHYSIOLOGIC PRINCIPLES UNDERLYING THE ADAPTATION OF THE HEART *

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The first lecture concerned itself with the development of two themes: (a) the physiologic and experimental background for the proper utilization of laboratory methods by the clinician, and (b) the use and value of certain newer graphic methods for interpreting cardiac and circulatory functions. Three purposes underlie the use of laboratory methods by the clinician, viz: (a) to gain evidence of phenomena which cannot be directly detected by our unaided senses (e.g., electric currents of the heart, chemical changes in blood and urine), (b) to give diagnostic signs quantitative values (e.g., blood pressure and vital capacity measurements), and (c) to broaden the significance and clarify the meaning of simpler clinical signs and symptoms. When the latter purpose has been accomplished, the clinical use of apparatus designed solely for this purpose is abandoned.

It was pointed out that clinicians and physicians, as a class, are tempted to employ circulatory apparatus as *"functional tests"* of the heart, of the circulation and of the patient's general condition; as witness, the many functional tests utilizing heart rate reactions, blood pressure, vital capacity, etc. The majority of such tests are devoid of sufficient physiologic background to make them reliable. The plea was made to utilize the data obtained by application of well established methods according to dynamic principles worked out by improved laboratory methods. To this end, the pressure curves from the aorta, ventricle and auricle and the volume curves from the ventricles were analyzed, and the relation that they bear to the optically recorded central arterial and venous pulses was discussed (fig. 1).

It was shown that the contour of the aortic pressure curve corresponds with that displayed by the

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* Abstract of lectures delivered before the Seventh Annual Meeting of Pacific Northwest Medical Association, Tacoma, Wash., July 5-7, 1928.

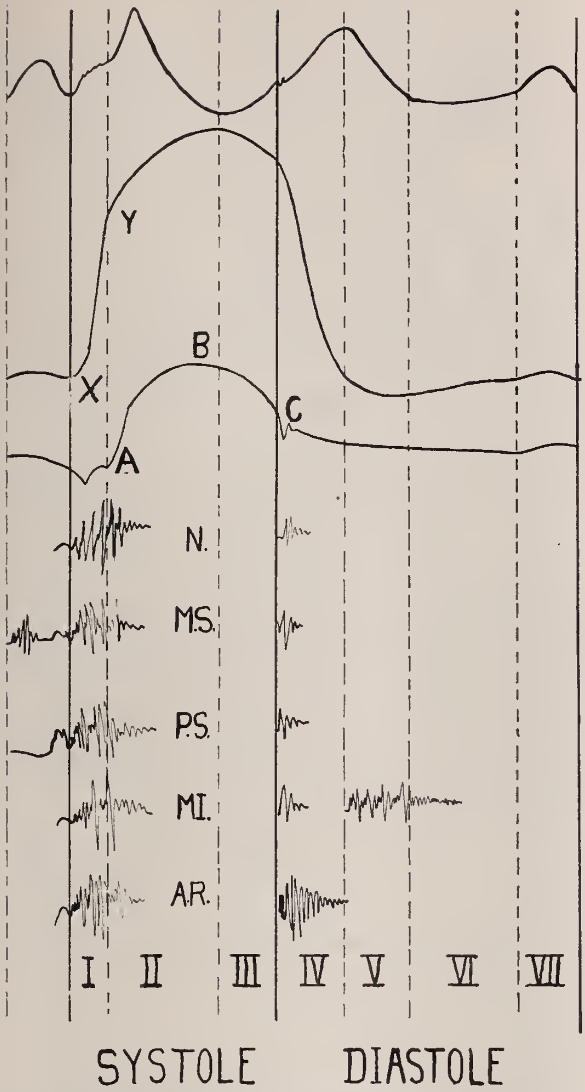

Fig. 1. Upper three curves, in order, are venous pulse, intraventricular pressure and central arterial pulse. Chart shows subdivisions of cardiac cycle possible by means of arterial and venous pulse alone. Systole and diastole between heavy lines. I, isometric contraction; II, maximum ejection; III, reduced ejection; IV, protodiastole and isometric relaxation; V, rapid inflow; VI, diastasis; VII, auricular systole. Below, time relations of normal sounds (N.D.), mitral stenosis murmurs (M. S.), pseudostenosis murmurs (P. S.), mitral insufficiency murmurs (M. I.), and aortic regurgitation murmurs (A. R.).

intraventricular pressure curve, and that changes in gradient of both correspond to variations in the velocity of systolic ejection. The contour of the subclavian arterial pulse is, therefore, useful in determining deviations in the ejection process. But it was also emphasized that this is not true of the peripheral radial pulse which undergoes transformations in contour for physical reasons. It was pointed out that, contrary to direct pressure records, central pulse tracings from patients are qualitative, not quantitative, but that approximate ordinate values for points *A* and *B* on the arterial pressure curve (fig. 1) can be established by determining the systolic and diastolic pressures in the brachial artery by well known methods.

The practical inference was further drawn that a combination of accurate arterial and venous pulse records enables the clinician to determine exactly not only the periods of systole and diastole but their subdivisions as well, viz: (a) the systolic phases of isometric contraction (often improperly designated presphymic phase), maximum ejection and reduced ejection, and (b) the diastolic phases of protodiastole, isometric relaxation, rapid inflow, diastasis and auricular systole. These are definitely indicated in the scheme of figure 1. Such determinations are of practical importance, for experimental work has shown that they indicate in what ways the contraction and relaxation functions of the heart are modified.

Brief attention was directed to the fact that diastolic pressure, as measured in man, gives an index of the afterload, against which blood is ejected (e.g., points A and Y on the arterial and ventricular pressure curves respectively), while venous pressures, as measured in man, supply a gauge as to the filling pressure of the right ventricle and hence of the initial pressure at X. The importance of this was elucidated in the third lecture.

A simple method of registering heart sounds accurately and directly was described and the clinical significance of changes in sound intensities and of cardiac murmurs was discussed. The author's experimental work has shown that accentuation of the first sound in any auscultation area is due to a steeper gradient of the intraventricular pressure curve (X-Y, fig. 1). It thus becomes an index of the vigor of cardiac contraction. Accentuation of the second sound over the aortic or pulmonic areas is not determined by systolic or diastolic pressure as measured clinically or experimentally, but by the pressure level at which the semilunar valves close at C (fig. 1). It is, therefore, a particularly valuable sign when applied to the pulmonary circulation.

The precise time relations of murmurs resulting from common valvular lesions was analyzed. They are also schematically indicated in figure 1, but particularly attention was called to the following facts: (a) that the presystolic murmur of mitral stenosis is separated from the onset of the first sound by a short interval, the crescendo murmur merging with the first sound being an auditory delusion; (b) that the systolic murmur of mitral insufficiency continues for a short space into diastole; (c) that the time relations and deviations of the diastolic murmur of aortic insufficiency and mitral *regurgitation* are vitally different.

The second lecture was devoted to a rather elementary analysis of the abnormal physiologic mechanism concerned in the production of cardiac irregularities and the basis for their clinical recognition by means of electrocardiograms. The foci for impulse initiation and the pathways of conduction under normal and abnormal conditions were analyzed. The normal path of spread and the approximate speed with which the impulse travels are indicated in figure 2. The passage of the impulse across the auricles is responsible for the P wave of the electrocardiogram, but reasons were given for the author's belief that this wave bears no relation to the amplitude or duration of auricular contraction. The ventricle is excited *via* the His-Tawara system. Hence the interventricular septum is excited first, the apex next and the basal portions of the ventricle last, the left somewhat later than the right.

The QRS deflection of the electrocardiogram is an expression of the passage of the impulses through the ventricular walls, as indicated by the arrows in figure 2. With reservations, we may say that the rise of the R wave in lead II is due to predominant excitation of the right ventricle, the decline to predominant excitation of the left. The author believes he has demonstrated that the QRS deflection precedes actual contraction of the ventricle and that the amplitude, deviation and time relations do not indicate corresponding variations in ventricular contraction.

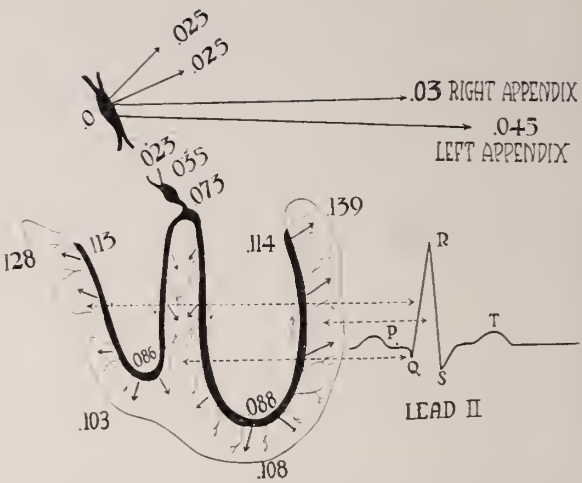

Fig. 2. Scheme shows the spread of the excitation wave over auricles and ventricles and predominant activations concerned in QRS deflections.

The most common physiologic disturbances lead-

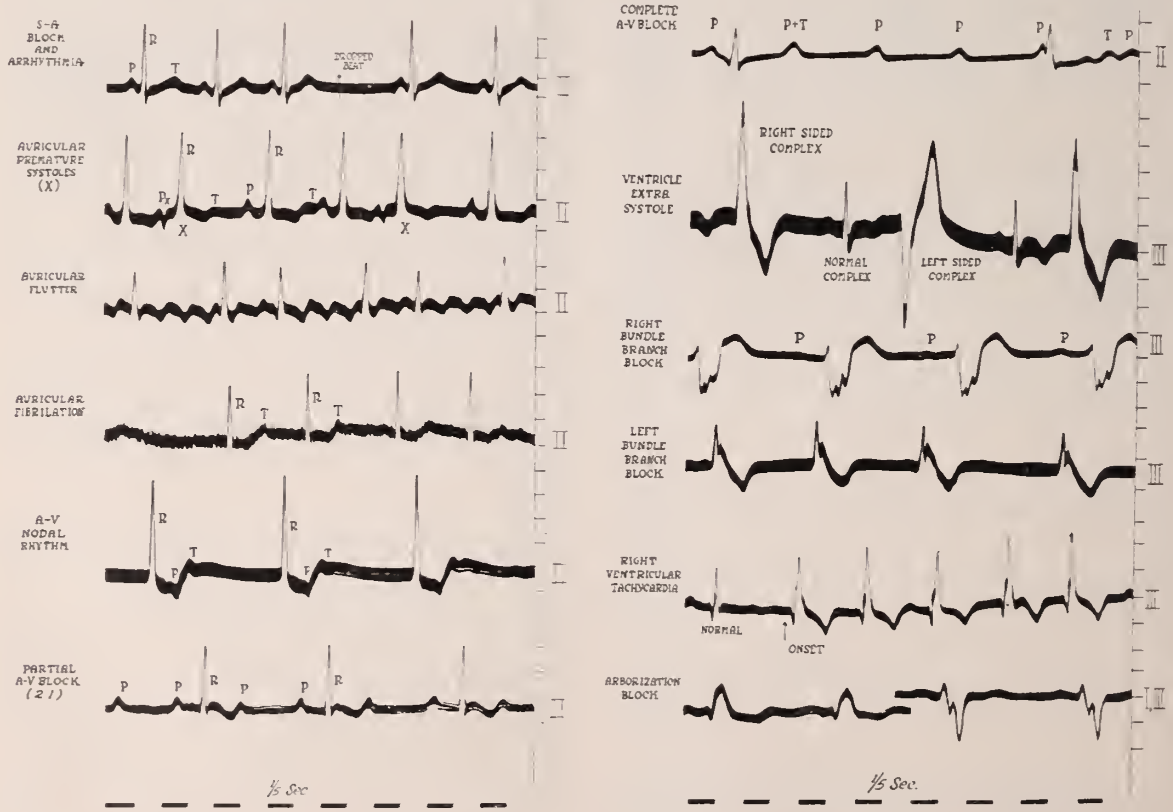

Fig. 3. Assembly of electrocardiograms showing at a glance the characteristic changes which occur in the more common forms of irregularity.

ing to clinical arrhythmias were analyzed and the electrocardiographic changes were presented. The latter are summarized in figure 3. The lecture concluded with a cinematographic demonstration of the heart action during the more common forms of arrhythmia, experimentally produced.

The third lecture was devoted to an analysis of the underlying factors in cardiac compensation. By means of "volume curve" records it was shown that the vigor of ventricular contraction is determined by the diastolic size of the ventricles. The clinical value of a closer study of heart size and its evaluation with respect to heart rate, blood pressures, venous pressures, duration of contraction phases, contour of pulse, etc. was logically developed. In general and up to certain limits, an increase in diastolic size results in an increase in the volume of blood expelled. This is made possible by an increased velocity of ejection and a lengthening of the ejection phase. Intraventricular curves show a steeper gradient (i.e., more forceful action), a higher pressure summit and a slight abbreviation of the isometric contraction phase, but a prolongation of entire systole. The pulse pressure is increased.

Normally, such an increase in diastolic size is occasioned solely by an increase in venous pressure which raises the tension in the ventricle at the time contraction starts (fig. 1, point X). This is also a factor when the auricle is distended by reflux of blood, owing to an insufficient mitral valve. The initial tension, as it is called, may, however, also be increased by incomplete systolic emptying, as occurs when arterial resistance is extremely high and during aortic stenosis. It is obviously increased also when an aortic regurgitation exists. No valid experimental proof exists that changes in ventricular tonus also affect diastolic size, though the possibility of such a cardiac mechanism cannot as yet be entirely ruled out. The lecture concluded with a cinematographic demonstration of the changes described above.

RELATION OF BLADDER PRESSURE TO BLADDER FUNCTION. Edwin W. Hirsch, Chicago (Journal A. M. A., Sept. 15, 1928), devised a method for observing the behavior of the bladder muscle under various conditions. A comparison of the tracings obtained from bladders normally distended with those in which irrigating solution was substituted for urine showed a great similarity. As the result of his observations Hirsch concludes that the so-called bladder contraction is due to the periodic intraabdominal waves which are caused by contraction of the diaphragm. Ordinary psychic states and sensory conditions do not affect the bladder directly, although there is a temporary obliteration of the normal bladder wave. This is the result of inhibition of respiration which controls the intraabdominal pressure and the bladder wave.

THE SYNDROME OF ACUTE CORONARY OCCLUSION

AS PRODUCED BY THROMBOSIS OF THE AURICLE *

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AND
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The pain mechanism of angina pectoris is unknown. The patient with a stab wound in the back, reported by Wallenberg,[1] who had intense oppression in the region of the heart, together with the sense of impending death, or the case of Lancereaux[1] in which a neuritis of the aortic and coronary plexuses was alone found, or that of Blondin,[1] in which the attacks of angina were said to be related to a pea sized tumor of the vagus nerve, and the patient dying of coronary disease should have a common explanation. The hypothesis given by v. Neusser,[2] in 1904, as an explanation for the character of the pain and its diverse radiation accompanying many different lesions, both within and without the heart, remains the best working explanation of the pain mechanism we have, but it remains an hypothesis. A physiologic and anatomic basis for the mechanism of the pain remains to be determined.

During recent years much thought has been given to acute coronary occlusion as a disease entity. A syndrome of acute occlusion, or of its associated infarction, has become fixed in the minds of clinicians as being rather pathognomonic of the heart lesion. Perhaps, because of this fact, it may be of interest to relate the story of the following two patients who suffered during life the typical symptoms of acute coronary occlusion and in whom at autopsy no interference with the coronary circulation was found. In the literature available to us we have not found clinical records of similar cases, but it is not to be supposed that auricular thrombosis with symptoms of coronary occlusion is rare, for these two cases came to our attention during the course of a year. It is to be assumed, rather, that the lesion is overlooked, as many persons suffering acute heart deaths do not come to autopsy. The records of the two cases are as follows:

Case 1. Mrs. R. R., aged 65 years, housewife, in January, 1926, suffered an attack of severe, continued pain under the right costal margin. The attack lasted for hours and was followed for a period of two months by lesser distress. After this length of time

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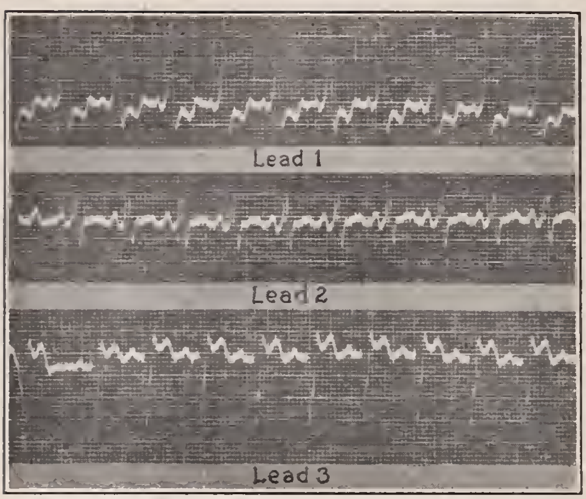
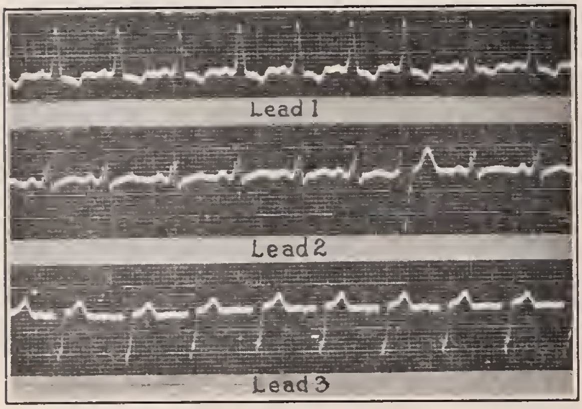
* From the Department of Medicine, University of Oregon Medical School.

[1] Cited by v. Neusser—Wilhelm Braumuller—Wien. u. Leipzig, 1904.

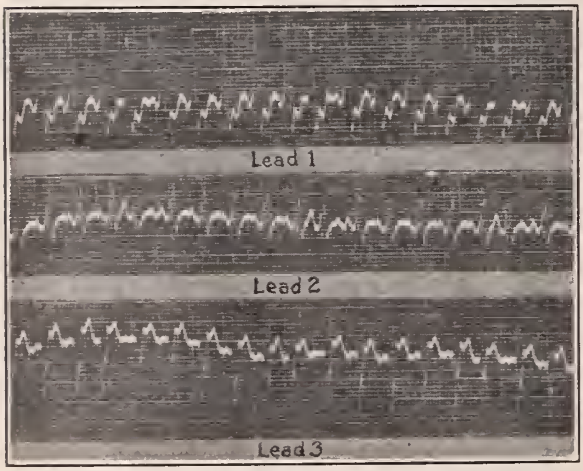
[2] E. v. Neusser—Wilhelm Braumuller—Wien u. Leipzig, 1904.



Case 1, June 19.



June 22.



October 18.

the distress disappeared until in June, 1926, when a second severe attack came on, and the patient was observed in hospital. Following the second attack she became comfortable until the middle of October, 1926, when she again returned to the hospital in great prostration and pain. There was marked local tenderness in the region of the gallbladder, a high leucocyte count, and a temperature around 99.0° F. Blood examinations in June were within normal limits. Death occurred November 12, 1926, with the clinical diagnosis of acute coronary infarction and the belief on our part that an empyema of the gallbladder existed. Brief clinical details are given in the table.

Autopsy by Dr. F. R. Menne, Department of Pathology, November 12, 1926. Anatomic diagnosis: Thrombosis of right auricular appendage with suppuration and cyst formation within its interior; moderate atherosclerosis of aorta and coronary arteries; hemorrhagic infarcts of right lung and anemic infarcts of right kidney in presence of thrombosis of the right renal vein; several associated and several less important anatomic findings.

Description of the heart and blood vessels: The space occupied by the heart is increased in size. The right heart is dilated. The heart chambers contain fluid and clotted blood. There are no valvular changes. The coronary orifices are patent and there are two right coronary orifices. The descending aorta contains numerous yellow atheromatous plaques, with evidence of calcification and linear wrinkling to be seen. The pulmonary arteries and veins, and the superior and inferior venae cavae are unchanged, except for a greyish-white thrombus protruding from the renal vein into the inferior vena cava. The cavity of the right auricular appendage is filled by a firm pinkish-grey clot which is adherent to the auricular wall and extends out into the main cavity of the auricle. On incising the clot reddish-grey purulent looking viscid fluid escapes (microscopic sections show purulent thrombus). The heart weighs 400 grams and is regular in outline. The wall of the left ventricle is 12-14 mm. thick. The myocardium on section is normal in appearance. The right ventricular wall is normal in appearance on section and the cavity contains an adherent clot which may be postmortem. There is slight fibrous thickening of the endocardium of the left ventricle. The left coronary artery is slightly thickened by atherosclerosis but its branches are nowhere occluded. The right coronary artery is freely patent and almost free from sclerosis.

The common bile duct is dilated but patent throughout. The gallbladder is thin-walled. The cut surface of the liver is extremely bloody and presents a somewhat mottled appearance.

Dr. A. N. Drury has kindly given us his interpretation of the electrocardiograms in Case 1.*

Case 2. C. E., male, aged 55 years, cook. Since an attack of influenza in December, 1926, patient has had spells of dyspnea, weakness and cough, but has never been entirely free of symptoms. July 28, 1927, after a heavy meal, he was admitted to hospital with severe epigastric pain, prostration, sweating and breathlessness. These symptoms continued in variable degree until November 18, 1927, when he died suddenly without warning. Brief clinical details are given in the table. The clinical diagnosis made was acute coronary infarction and chronic endocarditis with mitral stenosis and auricular fibrillation.

Autopsy by Dr. F. E. Menne, November 18. Anatomic diagnosis: Thrombosis of the left auricular appendage; marked chronic mitral endocarditis with stenosis; hydrohematopericardium; several associated and several less important anatomic findings.

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* June 19, 1926. Normal rhythm, regular, except for extrasystole in leads 2 and 3. These are of left ventricular, or more probably nodal origin, with abrasion of the complexes due to defective conduction down the right bundle branch, owing to prematurity.

June 22, 1926. Normal rhythm, with ventricular extrasystoles.

October 18, 1926. Normal rhythm, regular except for a premature beat after every sixth normal beat. The P waves are best seen in lead 2 mixed with the T waves. The premature beat is always preceded by a large T wave (see lead 2) and must, he thinks, be due to an ectopic P wave chipping in and giving rise to an auricular extrasystole. In lead 1 the ectopic P wave is indicated by a hesitation of the upstroke of the T wave.

Description of the heart and blood vessels: The space occupied by the heart is increased. The right auricle and appendage bulge. The left auricular appendage is firm and wrinkled. The pericardium is moist, smooth and glistening. It contains 50 c.c. of fluid. The myocardium of the left ventricle appears more purple in color than that of the right. The mitral valve is fused, the circumference of its orifice being 4.5 cm. There is a thrombus in the left auricular appendage which extends out into the lumen of the auricle. It is friable in texture and adherent to the wall. There is no evidence of thickening or occlusion in either right or left coronary artery, or any of their branches. The left ventricular chamber is dilated, the papillary muscles being thin and flat. The myocardium measures 1.5 cm. at the base and 1.0 cm. at the apex. It is soft and flabby and contains streaks of hemorrhage. The aorta is without noteworthy change; a few cracks exist in the intima, which is otherwise smooth and glistening. The aortic and other valves are without change. The pulmonary artery and vein are without noteworthy change. The superior and inferior venae cavae are slightly dilated.

The similarity of symptoms of the two patients to the syndrome of acute coronary occlusion may possibly be shown more graphically if the three are placed in parallel column:

Acute Coronary Infarction	Case 1.	Case 2.
Symptoms:	Symptoms:	Symptoms:
1. Pain severe, continuous, often abdominal.	1. Pain severe, continuous, R.U.Q.	1. Pain severe, continuous, epigastric.
2. Cardiac failure moderate.	2. Cardiac failure moderate.	2. Cardiac failure.
a. Dyspnea severe.	a. Dyspnea severe.	a. Dyspnea severe.
b. Fatigue extreme.	b. Fatigue extreme.	b. Fatigue extreme.
c. Weak heart tones.	c. Weak heart tones, gallop rhythm.	c. Heart tones weak, rumbling systolic and diastolic murmur at apex, inconstant. Rhythm, permanent A.F.
d. Basal rales.	d. Basal rales.	d. Basal rales.
e. Liver down slightly, tender.	e. Liver one finger down, very tender.	e. Liver one finger down, slightly tender.
	f. Left heart 13 cm.	f. Left heart 16 cm.
3. Sense of impending death absent [3]	3. Sense of impending death absent.	3. Sense of impending death absent.
4. Reflex symptoms, nausea, vomiting, collapse.	4. Reflex symptoms, nausea, vomiting, collapse.	4. Reflex symptoms, collapse, fainted.
5. Pallor, less often cyanosis.	5. Pallor.	5. Pallor.
6. Fever.	6. Fever.	6. Fever.
7. Leucocytosis.	7. Leucocytosis up to 54,000; 85 per cent polys.	7. Leucocytosis absent. 7,900; 68 per cent polys.
8. Pericardial friction rub occasional.	8. Pericardial friction rub questionable.	8. Pericardial friction rub thought to be present.
9. E.K.G. variable according to time taken.	9. E.K.G. suggestive of coronary infarction.	9. E.K.G., A.F.
	Clinical diagnosis:	Clinical diagnosis:
	1. Coronary infarction.	1. Coronary infarction.
	2. Empyema of gallbladder.	2. Mitral stenosis.
	Anatomic diagnosis:	Anatomic diagnosis:
	1. Purulent thrombosis of right auricular appendage.	1. Thrombosis left auricular appendage.
	2. Gallbladder normal.	2. Marked chronic mitral endocarditis with stenosis.

The lesson to be gained from analysis of the two given cases is probably comparable to one's understanding of the syndrome of peptic ulcer. As with the latter syndrome, one does not recognize the presence of ulcer by the periodic appearance of gnawing pain two or three hours after eating, which is relieved by food and by alkalies; one recognizes the presence of a motor disturbance at the end of the stomach, one chief cause of which is peptic ulcer. Likewise with the so-called syndrome of coronary occlusion, it may be more logical to think of a symptom-complex produced by different lesions, a chief one being occlusion of a coronary artery.

Understanding of the pain mechanism is not advanced by the study of these two cases. Local ischemia of the heart wall, even myocardial exhaustion, to meet Mackenzie's notion, do not seemingly enter into an explanation. The heart specimens were not properly fixed for microscopic study and were so badly mutilated in searching the coronary branches for thromboses that the presence of neuritis of the coronary or other plexuses could not be determined. The gross examination of the hearts in relation to the clinical course of the patients indicates a cause of angina independent of the aortic ring and the coronary bed.[4]

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[3] Sense of impending death has been given by Huchard, v. Neusser and others as one of the three cardinal symptoms of angina pectoris. Many patients suffering heart pain do not experience it. Coronary occlusion, at the time of v. Neusser's writing, was not looked upon as an entity, nor was it separated from other causes of angina. The absence of the sense of impending death in eleven consecutive cases of acute coronary occlusion, which we have carefully studied during life and at autopsy, prompts us to suggest that its absence may afford a point of differentiation between coronary occlusion and angina of other causes.

[4] Since writing the above report we have read the critical article of Keefer and Resnik (Arch. Int. Med., 41-6, June, 1928, p. 769) on "Angina Pectoris, a Syndrome Caused by Anoxemia of the Myocardium," in which the authors conclude that nearly all if not all proven cases of angina pectoris are associated with either coronary disease or aortic valve insufficiency or both combined, and that the pain, angor animi and sudden death are the result of the anoxemia accompanying these lesions. Oxygen want of the heart muscle is a condition to be reasonably expected in severe cardiac lesions. Could it not be the result of coronary spasm?

In 1914 an American doctor, 44 years of age, died suddenly of angina pectoris while at work in Eppinger's laboratory. He had suffered for three years repeated atacks of acute heart pain, the sensation of dying, apnea not dyspnea, and finally the sudden death. He had discussed with one of us his symptoms on numerous occasions. Often they came on effort, sometimes without apparent effort. The sense of dying, he said, was never a fear of death; it was a sense of actual dissolution at the moment and disappeared at once with the cessation of the atack. It had to him nothing akin to the sense of being afraid.

The autopsy was performed by Prof. Weichselbaum. The heart was congenitally too small for the size of the man's body. Aside from the apparent hypoplasia, the heart and its vessels showed no abnormal changes with one small exception; there was a pin-head size patch of the arteriosclerosis in the wall of the anterior descending branch of the left coronary artery, about 1 cm. below the vessel's origin. Nothing else abnormal was found. There was no suggestion of syphilis. Prof. Weichselbaum expressed the opinion that at the moment when effort reached the limit of the small heart's tolerance for work, by reason of the point of irritation in the coronary artery, the vessel entered a state of spasm, which finally continued until death took place from lack of sufficient blood supply beyond the point of temporary occlusion.

The assumption will remain logical, if ever it is found possible to render the coronary arteries spastic. Oxygen want of the portion of the heart wall supplied by the vessel would, therefore, logically be a result and not the cause of the condition. In the cases of auricular thrombosis above cited coronary disease and affections of the aortic valves did not enter, although the clinical symptoms during life were those of "true" angina pectoris.

OTITIS MEDIA, ITS COMPLICATIONS, MANAGEMENT AND TREATMENT[*]

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In writing on the subject of otitis media I realize I am dealing with a disease that is very old indeed in point of recorded history, and I cannot hope to add to the literature but only wish to emphasize some points which may be of value to my hearers.

French and English scientists, studying the pathology of Egyptian mummies, find evidence of what must have been ear disease, such as chronic otitis media with bone destruction, in and about the middle ear and mastoid. Hippocrates mentions that certain Greeks suffered with "great pain of the head and ears." No doubt the ancient Greeks suffered with earache and therefore with otitis media. One may trace evidences of ear disease from the ancients down to the present time. Probably the greatest impetus to the study and differentiation of otitis media as an entity was given by that group of Austrian and German otologists which includes Barony, Alexander, Hajek, Politzer and others of equal scientific skill and ability.

A knowledge of the embryologic development of the ear with special reference to the middle ear is needed in understanding the pathways of infection and the points of weakness in this region.

EMBRYOLOGY OF THE EAR

The ear of mammals and of man consists of the actual sense organs, the inner ear (labyrinth and cochlea), and the sound conducting apparatus, the middle and outer ear. In addition to its function in hearing, which belongs only to the cochlea, the inner ear also serves for the perception of the condition of equilibrium. The epithelial lining of the ear comes from the ectoderm, that of the middle ear from the entoderm and that of the outer ear again from the ectoderm.

The anlage of the auditory organ, like that of the olfactory organ and the crystalline lens, first appears as a plate of thickened ectoderm. This development first occurs in the embryo of about nine pairs of mesodermic somites.

In the embryo of about four weeks the auditory vesicle begins to show differentiation of the semicircular canals from the ventral portion of the cochlea. The anterior canal is the first to form, the posterior the second and the external the last. The development of the midlde ear in man has been made clear by the thorough investigation of Hammer. First, the period of the primary tympanic cavity begins in the first month and lasts into the seventh week; second, the period of the tubotympanic canal ends in the third month; and third, the transformation period, in which the tubotympanic canal is transformed into the definite tympanic cavity of the tuboauditiva: this last period is not completed at birth, but is continued into postfetal life. The manubrium mallei belongs genetically to the first branchial arch. The tubotympanic canal is formed from the primary tympanic cavity by a constriction which takes place in an aboral-oral direction.

The development of the auditory ossicles is a matter of considerable debate among leading embryologists. The conclusions of Reichert seem the most universally accepted, that is, that the malleus and incus are formed from the first visceral arch, and the stapes from the second. The auditory ossicles have reached their definitive size at birth, but the tensor tympani muscle makes its appearance at the end of the second month and the stapedius arises at the middle of the third month of fetal life.

The predominating etiologic organism in acute otitis media varies somewhat according to the reports of various authorities. However, the streptococcus leads in frequency in practically all of the statistics. The staphylococcus comes next, with the influenza bacillus and the pneumonococcus following in order.

The predisposing causes of otitis media may be grouped under acute infectious diseases, especially the exanthemata, and paranasal sinusitis. Dean calls attention to acute otitis media and mastoiditis directly traceable to paranasal sinusitis in children. Lierle[2] has reported a number of cases of acute otitis in infants which resembled "cholera infantum," and practically all of these were relieved immediately upon proper treatment of the middle ear infection. In cases presenting such symptoms he makes a strong plea for early and frequent examinations of the ears and paranasal sinuses.

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[*] Read before the Annual Meeting of Pacific Oto-Ophthalmological Society, Santa Barbara, Calif., April 18-21, 1928.

Lyman[3] says that at birth the mesodermal tissue, which is later absorbed, leaves various folds of mucous membrane persistent in the tympanic cavity in later life. Resorption of this membrane begins shortly after birth. The resorption begins in the lower tympanic cavity and by the eighth week of life the lower and middle portions of the tympanum form a distinct cavity, with thick mucous membrane folds persisting. The upper portion of the tympanum, the so-called epitympanic space, is not free from the mucous tissue until the first or well into the second year. Satisfactory drainage will take place if the infection is limited to the lower portion of the tympanum but not if the epitympanum also is invaded.

In checking up on the last twenty cases of acute otitis media in infants, I have found in fifteen the otitis media was secondary to paranasal sinusitis. Fourteen of these children were artificially fed and poorly nourished. Three cases were classified as primary mastoiditis, that is to say, they presented no cardinal symptoms of otitis media but upon operation frank mastoiditis had developed. Twelve of the number had bilateral otitis. The type of the causative organism showed a preponderance of the staphylococcus group without differentiation. Twelve per cent of the infections were caused by hemolytic streptococcus. It was found, however, that the type of organism did not always indicate the severity of the disease, which fact was probably due to that mysterious, variable factor known as individual resistance.

It is essential that the pediatrician and otologist work together in the treatment of these cases. Often the otologist after local examination considers an infant needs a myringotomy of one or both ears, but the pediatrician who has had the child under constant observation objects because of its good general condition. Another point, worthy of emphasis, is a careful search for paranasal sinus infection. It has been found that acute otitis media in infants is secondary to paranasal sinusitis in a large majority of cases. In the small series here reported it is seventy-five per cent.

Treatment of otitis should include measures, surgical if need be, toward the correction of the nose and throat pathology and a careful myringotomy under good illumination and aseptic conditions. However, conservative measures should be tried, such as ephedrin hydrochloride, 2 per cent spray, or drops in each nostril, followed in a few minutes with 2 to 5 per cent argyrol solution. Severe pain often demands incision of the membrane for relief when the appearance of the drum would suggest delay.

It is well to consider, in the diagnosis and treatment of otitis media in the young, besides past and recent history, the following signs and symptoms: earache, temperature and posture and general appearance of the patient. A leucocyte count should be made whenever possible and a myringotomy should be done whenever the tympanic membrane is red, swollen and bulging. It is a safe procedure to do a paracentesis in case of doubt. In some of the pediatric hospitals of the East, notably in Boston, this operation has become almost a routine procedure in such cases. It is well to have a roentgenogram of each mastoid region and this picture must be taken properly to be of value for a diagnostic study for, if improperly taken, it is often worse than useless. A culture made from the discharge at the time of the paracentesis often gives a very definite knowledge of the primary infecting organism. In severe infections, with high temperatures and meningeal symptoms, a blood culture if positive is of aid.

Shea[4] calls attention to glucose intolerance in children with suppurative sinusitis. With this in mind I have noted the sugar tolerance in my recent cases of suppurative otitis and have found it invariably low. In the presence of infection, such as suppurative otitis media or sinusitis, or both, it is well to remove sugar from the diet altogether, or to allow sparingly such sweets as honey. In frank cases of diabetes, so proven, the diet should be carefully supervised by the internist, and insulin given under his direction.

Acute suppurative otitis media may often be complicated or masked by bronchopneumonia, gastrointestinal disturbances, pyelitis and cystitis. Today in America there are two rather separate schools of opinion upon this subject. Briefly, one holds that acute suppurative otitis media and mastoiditis are often the cause of gastrointestinal, lung and urinary disturbances; the other that gastrointestinal disease, pyelitis and bronchopneumonia are the exciting causes of the otitis.

Lillie[5] reported a short series of cases before the American Laryngological, Rhinological and Otological Society in 1922, in which the septic type of temperature was not referred to the ear and the differential diagnosis revealed pyelitis, bronchopneumonia and gastrointestinal disease.

Reflex pains, resembling otalgia at times, must be considered in making a diagnosis of otitis. Sluder has described a painful syndrome associated with disturbance of the sphenopalatine ganglion. Patients with recurring otalgia, who have been carelessly classified in the psychoneurotic group, often are found to have a sphenopalatine ganglion disurbance. Severe otalgia without other symptoms may be caused by lues.

In this paper I have tried to confine my observations to acute suppurative otitis media in children. While this disease is no respecter of age, it is most common in childhood and therefore in order to protect the health and usefulness of our future citizens it is necessary that particular care should be taken in the diagnosis and in the proper management of the treatment.

SUMMARY

1. Otitis media is as old as the history of the human race.
2. The incidence of the disease is influenced by anatomic and hereditary factors.
3. The streptococcus is the most frequent exciting organism.
4. Paranasal sinus infection is often the initial localization.
5. Acute otitis media should be considered a complication rather than a clinical entity.
6. Early diagnosis and treatment is of the utmost importance. Most cases are seen at first by the pediatrician and general practitioner, on whom falls the duty of early diagnosis.

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TO HEAR OR NOT TO HEAR IS THE QUESTION

AN APPEAL TO THE FAMILY PHYSICIAN FOR THE EARLY DETECTION AND TREATMENT OF DEAFNESS*

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SALEM, ORE.

The study of sound with its multiplicity of uses is engaging the time and energy of hosts of men the world over. Sound is being produced and reproduced. It is measured and bought and sold. It is a commodity, and it is being transported by weight in cartons and canned, by every mode over all lines of travel; then, in that most wonderful way of all, by waves in the ether. God pity the man who cannot join with his fellows in a nationwide occasion, when millions can hear the voice of their leader over a circuit of thousands of miles.

The preservation of this function which contributes so much to the enjoyment of mankind depends almost entirely upon the family physician. He sees and advises in a majority of all beginning ear troubles. Upon him and upon the intelligent cooperation of his patients rests the task of recognizing and preventing the progress of incipient deafness.

The opportunity offered the general practitioner in the prevention of deafness is as yet inadequately recognized. Recent medical literature, however, contains abundant evidence of the wide scope of this aspect of preventive medicine. In his recent book, Dr. Harold Hays of New York City points out that "ninety per cent of all cases of defective hearing have or have had their trouble in the middle ear; in other words, the trouble has occurred in the conductive mechanism." Examinations of Chicago school children bear out this statement, as ninety-two and one-half per cent of all children found to have defective hearing had conductive interference. My own records, made up largely of chronic, progressive deafness, show very few who have normal conducting function. The need for early recognition and treatment of impairmant of the middle ear is clearly evident.

THE ANATOMY OF THE EAR

The ear is man's first receiving set. This mysterious little organ, which we are only now beginning to understand, is perfect in its mechanism and ample for the needs of the individual. It is a complete receiving set, attuned to all vibrations, allowing contact with all sources of sound.

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*Read before the Fifty-third Annual Meeting of Oregon State Medical Society, Salem, Ore., Sept. 1-3, 1927.

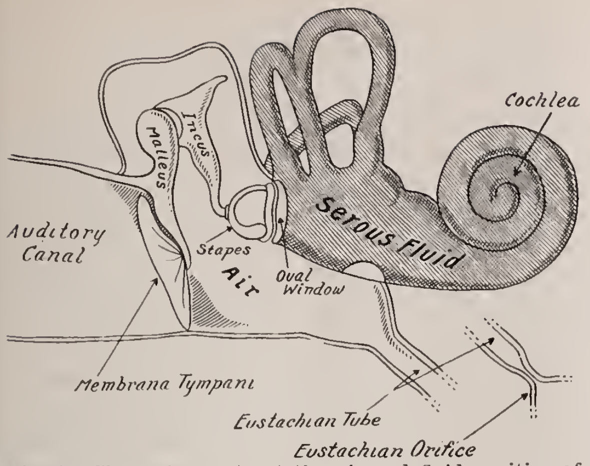

Fig. 1. Shows by contrast the air and fluid cavities of the ear.

Figure 1 is a reproduction of this marvelous organ. The internal ear appears shaded to indicate that the middle ear contains air and the internal ear a serous fluid. The artist has also brought up the pharyngeal end of the eustachian tube which is the most important structure connected with the preservation of our hearing. Healthy function or dysfunction at the mouth of the eustachian tube decides the history of the hearing in eighty-five per cent of the cases.

The receiving set of the ear, as shown in figure 1, is housed in two compartments. First, the middle ear, across which extends that peculiar aerial, composed of the hammer, anvil and stirrup. The handle of the hammer is incorporated in the drum-membrane. The impulse is carried through the anvil to the stirrup, whose foot is anchored in the oval window. The oval window is one of the openings giving access to the second compartment, the internal ear.

The internal ear is in three divisions, the vestibule, adjacent to and in communication with the middle ear by way of the oval and round windows; the three semicircular canals, and the cochlea. The cochlea is a round tapering chamber, coiled upon itself like a snail shell. This compartment contains a serous fluid which receives the impulse from the vibration of the foot of the stirrup in the oval window and conveys it to the end-organ. This end-organ is a nerve-ending from the brain, floating in the fluid contents of the cochlea. It is provided with a set of filaments resembling the strings of a piano, accommodated from longer to shorter by the tapering chamber of the cochlea. The function of this organ is selective, converting and amplifying. The sounds are again recognized by the brain in perfect reproduction.

FUNDAMENTAL CONDITIONS FOR GOOD HEARING

The function of hearing can be interestingly described as the fable of the elf of hearing who lives in the castles of the ear. His fairy existence is dependent upon the ability of his master to hear. He is the servant whose entire energies are expended in the administration of this special sense. Life is bright and worthwhile for him when hearing is acute. He is worried and unhappy when discomfort, disease and impairment occur. And when this delicate sense is lost, he delegates to the eye the task, supplementing by observation of objects the movements of which are the cause of sound. The most important of these are the movements of the lips in conversation.

In fancy we can understand the pride of this elf, sharing with his master the use and perfection of this wonderful and delicate sense. The first sounds on which the ears are tried are those in babyhood years; those of mother—soft, gentle, winning, kind tones. Then, through the changing years, come those of his playmates—joyous, free, engaging tones. Following these, the days of instruction and building through sound the things worthwhile from the related experiences of other men. And then comes music, the training of the ears to know the beauty of harmonic sounds. They are gradually attuned to understand the symphonies of earth and heaven. But of all these, the sweetest melodies are of the human voice, the voice of a friend. How happy through it all is the elf whose master enjoys perfect reception.

This elf lives a life of seclusion. He has no companionship. Of all the organs of sense, the ears are the best protected. They are located in impregnable citadels, completely surrounded by bony walls, in some parts the thickest of the skull, recessed for added security. Barring accident and disease, they will meet with uniformity the varying and exacting needs for sound reception to the last day of extreme age.

This elf of the ear has two avenues of contact with the outside. The external ear directs vibration, which is potentially active sound being conveyed through the air, to the drum membrane. There the vibration is taken up by the peculiar aerial in the middle ear. Only sound may come to him through this avenue.

The ear exists apparently without the aid of light, but air is a prime necessity. Without air its function is soon limited and destroyed. The eustachian tube, which supplies air, extends from behind the nose in the throat to the middle ear. The cavity made up by this long, very small tube, the middle ear and the mastoid cells, is lined by a deflection of the mucous membrane from the throat. It is distinctly a part of that whole mucous surface extending from mouth and nose to the bronchi, which is named the respiratory tract. This tract is particularly involved in keeping the proper balance between the living animal and the life-giving air about him.

There are two qualities which the air contained in the middle ear must constantly possess, if our elf is to be happy and the ear remain in health. First, the density or pressure of the air in the middle ear must be that of the atmosphere or slightly below. This gives the proper tension to the vessel walls within the chamber, and supports also the elastic drum-membrane from within against the same force from without, exerted through the external canal. It is also supposed, but not yet capable of demonstration, that the health of the internal ear is dependent upon this same force operating through the round and oval windows.

Second, it must be uncontaminated, especially by pathogenic bacteria. A condition of perfect asepsis is absolutely necessary. There must be some ever-acting process which maintains it. It is now thought to be accomplished in the following way: The cells in the lining mucous membrane are ciliated and their flagellae are constantly in motion, carrying the overlying film of mucus secreted by the gland structures toward the throat.

In 1920 Rich of Johns Hopkins demonstrated the opening and closing of the eustachian tube on a living dog. He found that the tube is normally closed, but that it opens during the act of swallowing and yawning. So that, although apparently no impulse from the ear can impel or inaugurate an opening of the eustachian orifice, it will always be the concern of the elf of the ear, for his life depends upon it. The complete, adequate and prompt opening and closing of the tube maintains atmospheric pressure and the mucous film moves out, carrying anything foreign which may have entered.

Dr. J. Lee Rogers of Spokane, Wash., after making over fifty casts of mastoid cavities, estimates that the average capacity of the eustachian tube, middle ear and mastoids taken together is one and one-half cubic centimeters. It follows, then, that in health the replacement involves only a very small quantity of air, and there is ample margin for safety.

The elf of hearing is apparently secure in his fastness, yet a heavy blow on the head or a fall will fracture the walls of his castle and in a moment irreparable destruction may come to its mechanism. More slowly, but just as certainly by contamination of the blood-stream in syphilis, tuberculous and constitutional affections, and occasionally by mestastasis from acute and other infectious foci are the functions of the internal ear destroyed. Often some force will obtrude itself through the external canal and rupture the drum-membrane; a sharp object will penetrate it; bodies animate and inanimate will find their way into the place to obstruct and irritate. Partial or complete deafness is the result. But many times, more than all these destructive agencies put together, are the things which befall our elf of the hearing by way of the air passage, the eustachian tube.

SUGGESTED PROPHYLAXIS

As prophylaxis against impairment of hearing the following definite measures are suggested:

1. Have a health examination once a year, giving special attention to the upper respiratory tract, and include a complete test of the hearing with the audiometer, if possible. The audiometer is an electrical instrument with a measured sound production. It is capable of rapid accurate testing of the ear by air and bone conduction.

2. Seek relief of all conditions of the nose and throat which in any way affect the mucous membrane at the eustachian tube orifice.

3. Insist upon correction of the habit (pernicious to ears) of mouth-breathing.

4. Broadcast the information that improper blowing of the nose, especially in the presence of a cold, is the cause of most middle ear infections. Train your patients to rest the handkerchief against the cheeks on either side of the nose and blow gently. It will be better in most cases to draw the nasal secretions back into the throat and wipe the nose without blowing. The choice in scarlet fever surely is not to blow the nose at all. I have inquired for some time in acute ear cases and found a large majority who state positively that they blew the nose and felt it in the ears before the pain began. Foreign matter was forced up the tube, sufficient to close it and develop gas or secretions, with pressure in the middle ear.

5. Advise sneezing with open mouth.

6. Insist that the same care be used in clearing the nose when irritated by the presence of water while in bathing.

SUGGESTED TREATMENT IN ACUTE EUSTACHIAN TUBE INFECTIONS

Fully as important is the suggested program of prophylaxis in the restoration of the ventilating function in threatened acute middle ear involvements. Much progress has already been made in handling cases of this type. For example, statistics show that fewer mastoid operations are being done than formerly. The explanation seems to be that good drainage of middle ear abscesses by early and thorough lancing of the drum-membrane has accomplished the change. Is it not time to take another forward step and reduce the necessity for lancing?

We know now that, if we have a middle ear abscess, there is possible involvement of the mastoid; in other words, we do not have abscess in the middle ear without some involvement in the mastoid. Can it not be as positively said that the presence of acute inflammation of the nose and throat, discomfort or pain in the ear is a serious matter and immediate steps to reestablish ventilation at the eustachian orifice are in order?

Let me recite a typical case:

> Parent calls, perhaps at night. Child has just begun crying with ear-ache. This is an opportunity to give valuable first aid. You go.
>
> History. No former sickness. Slight cold in head. If a young child, the mother has attended to the nose blowing by holding the nose and asking the child to blow or if older, the child may be able to say that, when he blew his nose, the ears were stuffed; or perhaps he sneezed with his mouth closed, and felt discomfort in his ears. Perhaps none of these, but you know there is closing of the tube and pressure behind the drum-membrane. On careful examination it is seen the drum-membrane is not bulging, the pain is in paroxysms. If ventilation can be again established and retained the middle-ear and mastoid will not be involved.

Suggested treatment.

1. Patient to lie on side, with affected ear up.

2. Patient to eat several small pieces of ice to chill the throat and reduce congestion about eustachian tube orifice. An application of adrenalin solution can be made by the physician, but the ice may be used by the nurse and repeated until danger to the middle ear has passed.

3. Patient to hold nose and swallow several times. The effect of this procedure can easily be demonstrated by placing a small manometer in one nostril and firmly closing both. The act of swallowing will show a movement of the droplet toward enclosed nose and throat, demonstrating that the column of air in the eustachian tube is moved toward the throat. Repeat every half hour.

This treatment in my practice for more than five years has given relief to a majority of cases if seen early. I have had the temerity to try it in cases where the drum was bulging and have gotten relief. However, if there is no relief in a short while and the drum shows increased congestion and bulging, paracentesis should be done, a culture made of the secretion and a half inch salvage edge gauze wick inserted, filling the ear full. This is changed before completely saturated, so that drainage may be perfected by capillary attraction. The patient is now asked to lie on the affected side, remaining in bed until temperature is normal and it is demonstrated that the mastoid area is not complicating the case. In addition, such attention to the nasal and pharyngeal mucous surfaces and general care are given as indicated. Holding the nose and swallowing three times in succession frequently is advised as long as the ear is in any way involved, and the hearing restored to the best possible.

The relief of the following pathologic conditions has also proven effective in the prevention and cure of deafness:

Nose. Congenital: Septal deflections and anomalies of the turbinate bodies.

Chronic: Traumatic sequelae of septum and turbinate bones. Hyperplasia and formation of connective tissue. Polypoid degeneration. Sinus involvements, resulting in defective ventilation of the postnasal space and postnasal discharge.

Acute: Colds, exanthemata, hay-fever, fumes and dust. Always to be considered with improper blowing of the nose, sneezing and clearing of the air passage while in water.

Throat. Congenital: Narrow postnasal and pharyngeal space.

Chronic: Infected tonsils, pharyngeal, faucial and lingual, surrounded by inflammatory area affecting the eustachian orifice.

Acute: Colds, exanthemata, hay-fever. With tonsillitis and lymphatic infiltration.

In conclusion, I am aware that many good men will take issue with the use of the word "cure" as describing the relief of the ear. These are the discouraged otologists, most of whose cases have been advanced, and restoration of function was impossible. It must be admitted that deafness, like all other disease, is not always curable. Some cases of deafness are curable part of the time. Some will be curable always, if recognized and treated carefully in their incipiency.

Every physician who has operated on the throat has advised parents that the child with acutely recurring deafness would be relieved by a careful removal of pharyngeal and faucial tonsils, and made good. That was a cure. Had such a child been allowed to go on, his would have been a case of progressive deafness. The case was one in which the hearing defect was pronounced in the beginning and the parents and patient were sufficiently concerned to seek relief. They will thereafter be confident under similar circumstances.

Twenty-five years ago tuberculosis was an incurable disease. Only a few recovered. Today the disease, uncomplicated, is considered curable. By painstaking early diagnosis and united cooperation of family physician and specialist, a convincing demonstration has been made. Cases are now seen early, and there is interested and confident cooperation on the part of friends.

As it was with tuberculosis twenty-five years ago, so it is now with deafness. All cases are seen in the advanced, emergency stage. The acute middle ear is in pain, and there is usually a bulging drum-membrane. The subacute ear in young persons is reported only after several remissions and periods of deafness. Almost all progressive cases have waited until the hearing of conversation is difficult. The elimination of this delay and the application of early preventive measures to deafness furnish one of the most important responsibilities and opportunities of the general practitioner today.

Discomfort and dysfunction must always be the conditions which call attention to departures from normal physically. In many cases of progressive deafness nearly complete impairment may occur without recognition of either. But much can be done, if there is a complete investigation of the slightest symptom in the ear.

In the field of visual impairment, unfortunately, corrective work has been made so profitable to the manufacturing and commercial interests that no end of printed propaganda, much of which is misstatement and exaggeration, has reached every nook. It is to be hoped that a similar situation will be avoided in corrective work of the ear. Whether it will or not will largely depend upon the family physician. Only as general practitioners quietly educate their clientele to take notice of slight hearing defects or unusual sensations in the ear will ear impairments be properly and expeditiously handled.

Do they miss numbers or names in public addresses? Do they ask for repetition in near conversation or from the next room? Do they hear the clock? How far is their watch heard? Does a certain familiar sound seem louder at some times than others? Is ringing or any adventitious sound present in the ears, or a click or popping on swallowing? Do the ears itch or feel full? Are all of these exaggerated when chilly or in a change of temperature or tired? Does a cold reduce the ability to hear for a time? Careful observation of these early symptoms combined with immediate and proper corrective measures will do much to check incipient deafness.

SUMMARY

1. A large majority of all acute middle ear and beginning progressive deafness cases are seen first by the family physician.

2. Any physician is remiss, who attends an ear and is unable to see the drum-membrane. He should have a good electric otoscope, or better perfect himself in the use of the head mirror.

3. All ear cases are seen late. In the acute ear, the first pain shows a case well advanced, and should have immediate relief, if possible, by way of the eustachian tube. In the progressive case any discomfort or loss of hearing is also an advanced case and should have a complete hearing test, and the correction of any contributing condition or vicious practice which inhibits the function of the eustachian tube or its orifice.

4. Closing the nostrils and swallowing is a safe and effective procedure, as an aid to ventilation and drainage of the middle ear.

5. The preservation of the hearing function and the cure of deafness constitute an intriguing field of endeavor for family physician, health service executive and otolaryngologist.

DISCUSSION

Dr. Frank B. Kistner: In a very fine way Dr. Brown has shown what the general practitioner can do by outlining a form of conservative treatment for the acute ear and upper respiratory infections in order to protect the ear. I want to endorse everything he said. There is very little for us to add, except to emphasize some of the things he has mentioned.

One of the first points which occurs to me is the question of nose blowing during an acute rhinitis. Dr. Brown mentioned the danger of blowing infection into the eustachian tube and infecting the ear. I think another danger, although one possibly not quite so great, is that when the drum-membrane is weak or softened by inflammatory process, forcible blowing jams a column of air against the membrane with the result that the drum may be stretched. The foundation for a flaccid drum is thus laid and, when it once becomes stretched, we have no therapy to tighten it up.

Dr. Brown cited the case of tonsils and adenoids in acute deafness in children. The removal of tonsils and adenoids does very frequently bring back the hearing and relieve the child of those catarrhal things which produce changes in the middle ear. In some twenty-five or thirty per cent of these cases there is a sinusitis conjoined with infected tonsils and enlarged adenoids. The removal of the tonsils and the adenoids does not always cure the sinusitis. You will see seventy-five or eighty per cent of the cases of sinusitis get well after removal of tonsils and adenoids. We have this other residual twenty-five or thirty per cent that do not get well. As to these children with acute deafness, after operation for tonsils and adenoids, the doctor should always request that they be brought back, that he may investigate as to whether or not the residual sinusitis has cleared up. If it has not you have left something that is just as bad as your tonsils and adenoids; you might as well have left the tonsils and adenoids.

This leads us to the subject of common colds. Numerous children have repeated colds, many of whom get well after the removal of the tonsils and adenoids. You may take it for granted when the child, after tonsillectomy and adenoidectomy, does not get over his tendency to have repeated colds (and you can apply the same thing to the adult when he continues to have repeated infections) he has a residual infection some place in the upper respiratory tract and it is probably in his sinuses. It may not show itself as a sinusitis by the frank discharge of pus from the nose. Many of these cases have a pussy or mucous catarrhal discharge only during the acute phase of the sinusitis.

Dr. J. Arch Stewart: I am heartily in sympathy with the thesis of the paper; that is, the drainage and care of the middle ear by way of the eustachian tube. But Dr. Brown made one point which I think is a mechanical mistake and should be corrected.

He made the statement that in an acute ear before drainage has taken place, before the ear-drum has been opened, the patient should lie on the unaffected side. Then he adds, after the ear-drum has been opened capillary drainage may be established by means of gauze, and the patient should lie on the affected side. That sounds plausible but is not a fact. The patient should still lie on the unaffected side, with the head in the pillow. Assuming it is the right ear, he should lie on the left side, with the nose well in the pillow. Recent work has been done to establish that the drainage is best promoted in this manner. The access of the drainage from the antrum and the middle ear is thus as perfect as it can be. If both ears are infected, obviously you cannot lie that way. Then the position is in a partially sitting position, with the chin well forward or well down on the chest.

Dr. L. B. Bouvy: This has been a very interesting paper. Dr. Brown has utilized this treatment for a long time. I heard him outline this procedure for obtaining drainage through the eustachian tube several years ago. He is one of the first to try this method which is now being used all over this country, I think. I just returned a year ago from Vienna and men on the boat discussing this treatment were well aware of it, and I asked them if they knew that it had been worked out by Brown in Salem, Oregon.

Dr. Frank E. Brown: I very much appreciate your helpful discussion and kindly criticism. The point on drainage position made by Dr. Stewart is a good one. The wick will then take care of the fluids appearing through the opening in the drum-membrane.

Regarding examination of the ear, a good view of the drum is most essential. Get an electric otoscope, or better yet a head mirror and light with a condensing lense. Examine the ears of every patient who comes in and you will soon succeeed with the difficult ones. The traditional laudanum and sweet oil, or the more modern phenol and glycerin have been a harmful delusion. Give the child nothing for the pain. Open and keep open the eustachian tube and the earache is cured. If this does not relieve, do a paracentesis.

BIOCHEMISTRY AND GEOCHEMISTRY OF IODINE

WITH SPECIAL REFERENCE TO THE ETIOLOGY AND PROPHYLAXIS OF ENDEMIC GOITER *

GULBRAND LUNDE, PH.D.
OSLO, NORWAY

(Concluded)

We now arrive at the questions of the etiology and prophylaxis of endemic goiter. The etiology of goiter cannot be regarded as completely elucidated. The iodine deficiency theory has of late won numerous adherents. And although there is no doubt that a relative lack of iodine must logically produce diseases in the thyroid gland, if the supply of iodine is too scanty to cover the requirements of the thyroid tissue in the production of thyroxin, yet it is equally certain that lack of iodine cannot be the only cause of endemic goiter.

The fact, however, that all the causes which increase the need of the system for iodine, such as puberty, lactation, climacteric periods favor the appearance of goiter, speak strongly in favor of the iodine-deficiency theory. In any case we can say with confidence that lack of iodine may be regarded as one of the causes of endemic goiter and most probably the primary one.

I will not at the moment go further into the various questions connected with the etiology of goiter. I will merely call attention to a series of experiments which I have conducted and which may possibly throw light on the question of etiology.

Let me first call to mind the fact that the French pharamacologist above mentioned, A. Chatin, could already demonstrate by experiment that the frequency of goiter and the concentration of iodine in the surrounding nature were in inverse proportion to each other. As is well known, his works did not receive the attention they deserved and they had, therefore, all too little influence on the development of the preventive treatment for goiter.

Later investigations have proved the correctness of Chatin's assertion. Von Fellenberg, for instance, has shown that the concentration of iodine in the surrounding nature is lower in the strongly endemic districts in Switzerland than in districts where goiter is less frequent. At the same time McClendon, with his collaborators, Williams and Hathaway, demonstrated that there was an inverse ratio between the iodine-content in drinking water and the percentage of goiter in the drafted men in the U.S.A. They found also a smaller iodine-content in the local foodstuffs from the goiterous districts than in the food from nongoiterous regions. A number of important investigations by Hercus and his collaborators, published about the same time as the works mentioned above, have shown that the same holds good in the case of New Zealand.

If we accept the iodine-deficiency theory as correct, it is obvious that there must exist a minimum iodine requirement for human beings. This may, of course, vary with locality and climate, and it may, moreover, be different at the various periods in the life of the individual. We know, for instance, that just those factors that intensify the organism's need for iodine, such as puberty, pregnancy, lactation and climacteric periods, also increase the tendency to goiter.

Without accepting the iodine-deficiency theory as absolutely correct, it is still clear that there must be a minimum iodine quantity, without which the organism cannot produce sufficient quantities of the iodine-containing secretion (hormone) in the thyroid gland. It is naturally of the utmost importance to determine the amount of this minimum quantity of iodine. We might adopt the method of determining the iodine-content in all the foodstuffs in goiterous and in nongoiterous districts and thus arrive at the average figures for the quantity of iodine which the food, consumed daily, places at the disposal of the organism.

Most careful investigations of this kind have been made by von Fellenberg in Switzerland, McClendon at the University of Minnesota and by Hercus and Roberts in New Zealand. McClendon calculated the intake of iodine through foodstuffs in a goiterous district in U.S.A. at .019 mg. per day. In New Zealand Hercus and Roberts calculated the mean iodine intake per person per day at .02015 mg. in a goiterous and .03485 mg. in a nongoiterous district. Von Fellenberg determined the iodine intake per individual per day in the goiterous district of Signau at .0130 mg. and at .0313 mg. in the almost nongoiterous district of La Chaux-de-Fonds.

Such investigations, however, take time, and still give no complete picture of the daily total iodine intake. Figure 3 gives an illustration of the iodine sources, from which the iodine needs of humanity are supplied.

We see that we must also reckon with no small quantities in drinking water and in the atmosphere. It is especially difficult to determine the quantities of iodine that are inhaled daily. Another difficulty lies in the fact that not all the iodine contained in the foodstuffs consumed is resorbable, and it is, of course, only resorbable iodine which interests us in our attempt to determine the minimum iodine requirement.

Instead of investigating the quantities of iodine-intake we can investigate iodine excreted. Von Fellenberg, for example, determined the iodine excretion through the urine for the inhabitants of goiterous and nongoiterous districts. He found also a considerably lower averoge iodine content in the surrounding nature in districts where goiter percentage was highest. It must be remembered that all iodine excreted is not excreted through the kidneys alone but, even if the excretion figures we get by determining the iodine content of the urine are undoubtedly too low, still they give us a good material for comparison.

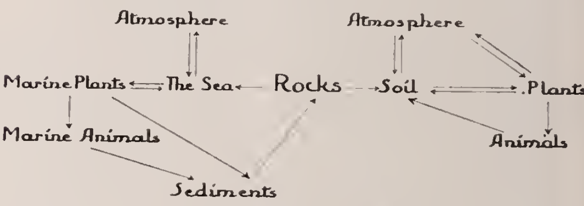

Fig. 3. Human iodine sources.

In collaboration with Johan Nicolaysen of Oslo, I have examined the excretion of iodine through the urine in the case of inhabitants of the Norwegian goiterous districts, Sandsvaer, which lies west of the Oslofjord, and runs inland, beginning some few kilometers from the coast. Goiter is here endemic. Investigations regarding the incidence of goiter among school children have been carried out by Nicolaysen. In order to determine the daily iodine excretion in the district as a whole, from five to ten healthy adults from the various school districts were selected for experiment.

Men only were chosen for the investigation, for, as von Fellenberg has shown, the excretion of iodine is not always constant in the case of women due to the facts before mentioned that under certain conditions they show an increased need of iodine. We must also bear in mind that none of the persons examined had goiter and must take this into consideration when we compare our results with those of von Fellenberg. Our aim was not to determine the excretion of iodine for goiterous persons, but to get an average of the daily excretion of iodine in normal persons in that district. Experiments recently carried out in collaboration with Johan Holst had shown there is a great difference in the rate of excretion of iodine in the case of goitrous persons, compared with people who are normal, and the total iodine metabolism is also quite different. It would, however, take too long to enter into these points now.

TABLE 5

RELATION OF INCIDENCE OF GOITER AMONG SCHOOL CHILDREN IN SANDSVAER, NORWAY, TO EXCRETION OF IODINE

District	*Goiter in per cent*	*Excreted iodine in .001 mg. in 24 hours*
Hostvedt	59.7	40
Vittingfoss	55	48
Ljoeterud	54	29
Meheia	53.6	39
Saggrenda	43	64
Komnes	39.7	48
Berg	38.6	56
Efteloet	36.6	65
Verp	36	87
Ruud	30	61
Vik i Sogn	0	173

Table 5 shows the average excretion of iodine through the urine, compared with the figures for the incidence of goiter in school children in the goitrous district of Sandsvaer. The figures for the iodine excreted in twenty-four hours were arrived at in the following way. The iodine content of night urine was determined and from this the excretion of iodine in twenty-four hours was calculated on the assumption, which is approximately correct, that a similar amount of iodine is excreted every hour.

In comparing figures for the excretion of iodine in adult men with those for goiter, we must take into consideration that the latter figures refer to school children, who naturally use a smaller quantity of foodstuffs and whose bill of fare, moreover, is somewhat different.

of iodine excreted falls in proportion to the rise

Our table shows that on the whole the amount of the goitrous percentage. For the sake of comparison I have also included figures for the non-goitrous district, Vik i Sogn. These figures were found by von Fellenberg, when he examined samples of urine that F. C. Holst, at my suggestion, had sent to him. For comparison with the figures in Table 5, I add the figures which von Fellenberg found for the excretion of iodine in Switzerland and on the Ligurian coast.

TABLE 6

INCIDENCE OF GOITER IN THE POPULATION IN SWITZERLAND IN RELATION TO EXCRETED IODINE

District	*Goiter in per cent*	*Excreted iodine in .001 mg. in 24 hours*
Effingen	1	70
Kaisten	61.6	17
Hunzenschwiel	56.2	18
Forte dei Marmi	0	112

In comparing von Fellenberg's figures with those for Norway, we must take into consideration that the percentage of goiter for the three Swiss villages refers to the whole population, while Norwegian figures only deal with the incidence of goiter among school children. We arrive, therefore, at the following conclusion: *Our investigations have proved that the quantity of iodine excreted through the urine in adult males in Norwegian goitrous districts is approximately in inverse ratio to the incidence of goiter among school children in the same districts.*

If we are now agreed that one of the fundamental factors in the spread of endemic goiter is a deficiency in the intake of iodine, the question of prophylaxis will naturally be how to abolish this deficiency, that is to say, how to increase the intake of iodine. May I in a few words review the history of the prophylaxis of goiter. I will here confine my remarks exclusively to pure prophylaxis, and will not enter into questions of therapeutics.

Prevost (Geneva), in 1849, prescribed iodine as a prophylactic for goiter. His method was tried in France and somewhat later in Austria and Italy, but, as we know, it was discredited as the doses used were too strong.

Not until 1909 did the question again come into prominence, when Marine and Lenhart showed that the so-called carcinomata of trout were in reality enlarged thyroids, and could be prevented by putting small quantities of iodine in the water. In 1917 Marine and Kimball, as we know, commenced the preventive goiter treatment for school children in Akron, Ohio. These attempts and their excellent results are so well known that I shall not linger over them.

In Switzerland the preventive treatment of school children with small quantities of iodine was again resumed in 1919. I may mention names like Eggenberger, Hunziker, Klinger and Roux. Hunziker had already, in 1915, published his remarkable paper, "Goiter, the System's Adaptation to Iodine-deficient Food" (Der Kropf, eine Anpassung an jodarme Nahrung), and he had already for several years practiced goiter prophylaxis on his patients. In Norway the preventive treatment of goiter with small quantities of potassium iodide was introduced by Nicolaysen.

As is well known, the so-called iodized salt has been introduced into several goiterous districts, thereby not only to reach children but the whole population. The iodine content in the iodized salt is variable (in Switzerland 0.038 mg. in 10 mg. salt, which is taken to be the daily requirement of each individual). The iodine content of the iodozide salt in U. S. A. is considerably higher than that of the salt used in Europe.

Instead of using iodized salt, attempts have been made, especially in America, to add small quantities of iodine to the drinking water. For instance, by Little in Rochester, New York, by Goodfellow in Rochester, Ilkeston and Heanor, and by Sherman in Sault St. Marie, Michigan. This method is much more expensive than the use of iodized salt. All over the world the preventive treatment of goiter with iodized salt has shown a reduction of the percentage of goiter in school children.

There are, however, certain difficulties in the way of a general use of iodized salt. In the first place, some people have qualms about its use, and it is true that the ionized iodine in the form in which it appears in iodized salt may really be dangerous for goitrous persons, if it were not that the addition of the salt prevents the use of too strong doses. Ionized iodine may produce hyperthyroidism. There are, however, really very few cases, if on the whole there are any where the small quantities of iodine contained in iodized salt in Europe, have really produced hyperthyroidism. But, anyhow, many people there are hesitant about its use. The iodine content of the salt in U. S. A. is much higher, as I have already mentioned.

Another unfortunate characteristic of the iodized salt is that its iodine-content is not always constant. Von Fellenberg, for instance, has demonstrated that the iodine-content undergoes a change when the salt is kept in store.

Our researches at Sandsvaer have led us to another method of goiter prophylaxis. When we take the iodine excretion figures for the inhabitants of this district one by one, we note the fact that the quantities of iodine excreted in twenty-four hours are in the case of some persons very high, in the case of others very low. Some of the figures are exceptionally high. During my investigations of the urine Nicolaysen examined the food lists of the persons tested, and on comparing our results we found that the persons with great iodine excretion almost without exception had eaten sea fish during the previous week. He could also show that this district had been regularly supplied for some time with sea fish, and that its consumption was on the increase. With the help of some tables, I shall demonstrate to you what a very great quantity of iodine is excreted by consumers of fish.

Table 7

RELATION BETWEEN EXCRETED IODINE AND QUANTITY OF SEA FISHES IN THE FOOD

No.	Excreted Iodine in .001 Mg. in 24 Hours	Sea Fishes in the Food	No.	Excreted Iodine in .001 Mg. in 24 Hours	Sea Fishes in the Food
1	42		26	128	++
2	57		27	36	+
3	62		28	6	
4	25		29	52	+
5	10		30	101	(?)
6	41		31	108	++
7	19	+	32	35	+
8	22		33	140	++
9	28		34	50	
10	36		35	37	
11	38	++	36	69	+
12	55	++	37	23	
13	50		38	31	
14	105	+++	39	79	(?)
15	212	+, KJ	40	56	
16	14	+	41	49	+
17	67	+++	42	73	+
18	118	++++	43	49	
19	39	+	44	86	+
20	20	+	45	43	++
21	83		46	27	
22	11		47	13	
23	214	+, KJ	48	73	++
24	59	+			
25	101	+			

When we take into consideration the fact that most of the persons examined had eaten *no fish at all* on the day before the urine test, we see that we are not dealing with an isolated accidental increase in the quantity of iodine excreted, but of an increased iodine metabolism, caused by the use of fish food. These results show us the simplest and most natural means of goiter prophylaxis, at least as far as Norway is concerned. We have only to increase the consumption of fish in the goitrous districts and to facilitate the distribution of fish products in the inland districts.

The advantages of such a prophylaxis are manifest. Iodine is contained in the fish, as we have been able to show, in a natural organic combination, and in the organism it changes (very possibly gradually) into the active ionized form. This is seen clearly from the fact that the excretion of iodine by consumers of fish was shown to be high, even when they had eaten no fish the day before, while (as we have been able to show) inorganic iodine which is ingested leaves the body within twenty-four hours. By means of fish prophylaxis the necessary iodine is obtained in a way that is better suited to the needs of the organism.

De Quervain, after having pointed out the large quantities of iodine consumed with their food without any injury by the dwellers of the coast, writes as follows: "It is, therefore, a great question whether the form of the iodine does not play a certain part. With our food the iodine comes to us predominantly in organic combinations, while in the case of iodized salt we get it in active, ionized form. It is, therefore, not unreasonable to suppose that this active form, although no doubt as regards goiter prophylaxis it is more effective, yet in spite of there being only physiologic quantities to hand, may cause toxic effects in a population which on account of the presence of goiter are specially sensitive."

The two Austrian physicians, Wiesel and Kretz, are also strongly in favor of a goiter prophylaxis by means of iodine in natural organic combinations. They write as follows: "The ionized, inorganic iodine is extremely effective (we have only to look at the effect of the tiniest dose of Lugol solution or the effectivity of iodized salts). The organic iodine is first decomposed in the body in a way that probably corresponds to the natural requirement of the organism, and only gradually changes into the active, ionized form. In agreement with this supposition we have the fact that nonionized, organically combined iodine, such as specially occurs in plants and in animal organisms, never leads to iodine intoxication, in spite of the fact that this iodine is ingested in quantitatively larger amounts than in, for instance, the iodized salt. Neither has there ever been known a case of persons moving from an iodine-deficient goitrous district to one that is nongoitrous and richer in iodine, and getting symptoms of iodine intoxication."

After a lecture which I delivered before the Society of Physicians in Vienna (Gesellschaft der Aerzte in Wien), J. Wagner-Jauregg expressed himself strongly in favor of the use of fish products as a prophylactic against goiter. He said: "The use of sea fish would be a very desirable prophylaxis against goiter, and it would be a very excellent thing if physicians would make propaganda for its use, especially for young people with goiter, or who are in danger of getting it, and also for pregnant women."

The last point is the very great importance of a study of the iodine-content of the various fishes and fish products in order that we may be able to form an idea of what quantities of iodine are at our disposal, Bourcet examined various kinds of sea fish and found in them all large quantities of iodine. Before closing our investigations a number of results obtained by Tressler and Wells of the U. S. Bureau of Fisheries regarding the iodine-content of various fish products came to our knowledge. Jarvis, Clough and Clark had examined the iodine-content in Pacific Coast salmon, and recommended this also as a prophylactic against goiter. And some stray determinations of iodine in fish products were also available.

In collaboration with Haaland and Madsen I examined some species of Norwegian teleosts with the results already mentioned (table 3).

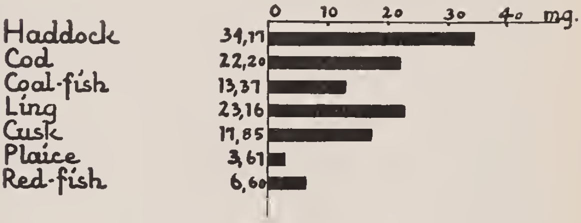

Fig. 4. Average iodine content of flesh on Norwegian teleosts in mg. per kg. water free substance.

Karl Closs and I examined Norwegian dried fish and split cod, both of which showed a somewhat lower iodine-content than the fresh fish.

TABLE 8

IODINE-CONTENT OF NORWEGIAN STOCK-FISH AND SPLIT COD IN MG. PER KG. WATER-FREE SUBSTANCE

	Fresh Fish	*Dried Fish*	*Split Cod*
Cod (Gadus morrhua)	22.20	16.6	6.8
Haddock Gadus aeglifinus)	34.2	30.6	....
Coal-fish (Gadus virens)	13.4	4.8	....

The endemic districts, however, lie far inland, and the transport of the fresh fish is difficult and expensive. We have, therefore, examined a number of samples of canned fish goods, and in these

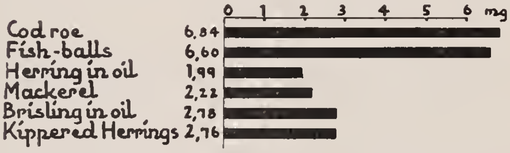

Fig. 5. Average iodine content of Norwegian preserved sea food in mg. per kg. water free substance.

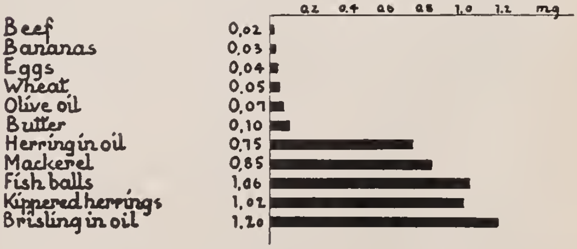

Fig. 6. Average iodine content of some foodstuffs in mg. per kg. moist substance.

TABLE 9

IODINE CONTENT OF NORWEGIAN SARDINES IN OLIVE OIL

BRISLING (CLUPEA SPRATTUS)

IODINE CONTENT IN MG. PER KG.

BRISLING		OLIVE OIL		TOTAL CONTENT OF CAN	
MOIST	WATER-FREE	MOIST	WATER-FREE	MOIST	WATER-FREE
				0.21	0.45
0.83	1.97	0.75	0.77	0.80	1.55
1.28	2.85	0.75	0.76	1.19	2.22
1.50	3.51	1.29	1.34	1.44	2.64

TABLE 10

IODINE CONTENT OF NORWEGIAN KIPPERED HERRINGS (CLUPEA HARENGUS)

IODINE CONTENT IN MG. PER KG.

HERRING		LIQUOR IN CAN		TOTAL CONTENT OF CAN	
MOIST	WATER-FREE	MOIST	WATER-FREE	MOIST	WATER-FREE
				0.33	0.93
0.38	1.08	0.50	0.77	0.39	1.04
				0.51	1.43
0.53	1.44	1.05	1.30	0.67	1.64
1.29	3.55	0.50	2.99	1.26	3.54
1.89	4.95	0.57	1.06	1.86	4.81

TABLE 11

IODINE CONTENT IN MG. PER KG.

KIND OF PRESERVED SEA FOOD	MEAT		LIQUOR IN CAN		TOTAL CONTENT OF CAN	
	MOIST	WATER-FREE	MOIST	WATER-FREE	MOIST	WATER-FREE
Herring (Clupea harengus) in olive oil.	0.75		1.51		0.92	
Herring (Clupea harengus), smoked....	0.75	1.99	0.79	0.83	0.77	1.47
Herring (Clupea harengus), smoked....					0.31	0.60
Mackerel (Stomber scombrus)..............	0.85	2.22	1.90	20.70	1.09	3.44
Roe of Cod (Gadus morrhua)	1.92	6.84	2.51	27.87	2.01	8.03
Fish-balls (Gadus aeglifinus)..................	1.06	6.60	0.42		0.82	7.74

also we detected the presence of great quantities of iodine. These researches were principally carried out in collaboration with Madsen. Tables 9-11 and figures 5-6 show the result of our researches. The quantities of iodine determined in the canned fish examined by us are so great that a reasonable quantity in the weekly bill of fare is sufficient to cover the iodine requirements of any organism, even in strongly endemic districts.

I have emphasized the importance of iodine being supplied in organic combination. It is, therefore, of the greatest interest to find out in what organic combination iodine exists in fish foods. I have collaborated with Karl Closs in this study, and we examined especially Norwegian split cod and some other fish products. We were able to demonstrate the presence of iodine in combination with albumins, also with fats or lipoids and in other organic combinations. Some very small amount was present in inorganic form. These researches into the nature of the iodine compounds in fish products are being continued.

I will conclude by saying that *in fish products we have a useful and simple means of supplementing the iodized salt prophylaxis. In the fish products examined, and especially in the easily transportable canned goods, we determined a high content of iodine in organic combination.*

OCCIPUT POSTERIOR POSITIONS AND THEIR TREATMENT *

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One of the most important conditions arising during the course of obstetric deliveries is occiput posterior position with its various phases and complications. It is often undiagnosed or mismanaged with attempts at operative deliveries being made either too soon or too late, so that equally poor results occur for both the mother and baby. The child is frequently stillborn, or may receive severe intracranial injuries during delivery. The mother may suffer severe lacerations of the pelvic floor or cervix and tears of the broad ligaments with their later ill effects. The incidence of puerperal sepsis and morbidity becomes high with its resulting syndrome of chronic pelvic pain and distress later in life. The mortality rate is also proportionally increased.

In presenting this subject no attempt is being made to bring forth a new plan of treatment. The purpose is to state clearly the diagnosis, course, management and operative treatment of occiput posterior positions with special emphasis on the x-ray method of diagnosis. At the Minneapolis General Hospital from January 1, 1927, to January 20, 1928, there were 972 obstetric deliveries. In this series there were 200 consecutive primary occiput posterior positions, a percentage of 20.6 per cent. Of this number 146 or 15 per cent were of the right and 54 or 5.6 per cent of the left occiput position. There were 90 primiparae, 27 secundigravidae and 110 multiparae. The method of delivery was as follows:

Spontaneous	153	76.5 per cent
Low forceps	30	15.0 per cent
Midforceps	14	7.0 per cent
Version	3	1.5 per cent

There was one maternal death in this series, a midforceps delivery, death occurring on the twenty-first day from puerperal sepsis. At postmortem a purulent endometritis was found with cloudy swelling of the liver and kidneys. There were no other cases of puerperal sepsis. An occasional mild type of febrile puerperium occurred in a small percentage of the cases, due to the usual incidental complications of the puerperium.

There were two neonatal deaths and no stillbirths, making a fetal mortality of 1 per cent. Both deaths were due to intracranial hemorrhage following spontaneous deliveries, one case dying on the second and the other on the third day after delivery. There were two other cases showing signs of cerebral injury following forceps deliveries; both recovered, following the intramuscular injection of citrated whole blood from the mother.

The diagnosis of an occiput posterior position can be made by finding the back far posteriorly on either the right or left side, palpating the head in the pelvis with the cephalic prominence on the opposite side of the back, finding the fetal small parts in the anterior portion of the abdomen opposite the back, and obtaining the fetal heart on the same side as the back but far out in the flank. Later, after the cervix has become sufficiently dilated and the head well engaged, the characteristic rectal findings are present. In a right occiput posterior the sagittal suture will be felt in the right oblique diameter of the pelvis, the small fontanelle on the right and posteriorly, and the large fontanelle on the left and anteriorly. It is a good plan to make a vaginal examination under aseptic technic at the end of twenty-four hours of active labor or when in doubt as to the condition present.

The diagnosis is not so easily made in all cases. It is a good plan early in labor to suspect and reexamine for an occiput posterior position, whenever any of the following factors are present: (1) The back on the right side of the mother, (2) easily palpable small parts anteriorly, (3) the fetal heart far out in the flank, (4) early rupture of membranes, often before the onset of labor, (5) slow dilatation and effacement of the cervix, (6) failure of head to engage or descend, (7) a deflexed head, (8) prolonged labor with hard pains and no progress, especially in primiparae.

When in doubt, a positive diagnosis can always be made by means of the x-ray. The head will be found in the pelvis, the exact position in the pelvis varying with the amount of engagement; the breech in the fundus; the back either on the right or left and posteriorly so that it lies close to and parallel to the mother's spine and the fetal parts well anterior just beneath the anterior abdominal wall. In cases with deflexion to a median vertex presentation, the fontanelles are often found occupying the same level in the pelvis. In certain cases with prolonged labor and mildly contracted pelves, a certain amount of moulding and overriding of the cranial bones can be detected.

The course of occiput posterior positions varies, the termination being dependent on several factors. The parity of the patient must be considered, there being a far greater tendency for multiparae to

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* From the Obstetric Service of Dr. F. L. Adair at the Minneapolis General Hospital, Minneapolis, Minn.

terminate spontaneously, whereas the prmiparae furnish more indications for operative delivery. In this series the percentage of operative deliveries in relation to the parity was as follows:

Parity	Total	Spontaneous	Operative	Per cent Operative Cases
Primiparae	90	53	37	40
Secundigravidae	27	21	6	22
Multiparae	83	79	4	3.6

Of prime importance is the character and extent of the rotation of the occiput. According to the individual case there will be:

1. A spontaneous anterior rotation through an arc of 135°, the head being well flexed. This results in the most favorable type of case. Rotation may either take place just above the spines or not until later in labor when the pelvic floor is reached.

2. A posterior rotation through an arc of 45° so that the face then looks to the pubis and the occiput points to the hollow of the sacrum. Rotation in this type of case usually occurs before the head reaches the pelvic floor.

3. A position of deep transverse arrest with the occiput lying between the spines of the ischium in a transverse diameter. Quite often the leading portion of the head will be found in a transverse position below the spines and almost upon the pelvic floor. The low position in these cases is due to the moulding and caput succedaneum formation of the head, the engaged portion of the head still being at the spines.

4. A position, usually in midpelvis, in which the occiput remains at the original posterior position at 135°, becoming a persistent occiput posterior position.

5. A failure of engagement with the head high in the pelvis in a persistent occiput posterior position or a deflexion attitude.

The following table shows the type of rotation occurring in this series:

Anterior rotation	157	78.5 per cent
Transverse arrest	13	6.5 per cent
Posterior rotation	30	15.0 per cent

The dilatation and effacement of the cervix is delayed in a large percentage of cases. This may be due to several factors; first, early rupture of the membranes so that the hydrostatic action on the cervix from the bag of waters is lost; second, the position of the head, there often being a deflexion of the so-called median vertex or military attitude presentation, with the smaller diameters of the head, rather than the large suboccipital bregmatic diameter, attempting to dilate the cervix; third, weak or insufficient uterine contractions, either a primary or secondary uterine inertia. Prolonged labor is the result of these forces, often bringing the total length of labor up to 24 to 36 hours in multiparae and from 48 to 72 hours in primiparae. The longest labor in this series in a primipara was 81½ hours, in a multipara 36¾ hours. The shortest labor in a primipara was 4 hours; in a multipara 2¾ hours.

The condition of the soft parts must be considered. A rigid perineum furnishes an indication for forceps delivery even after complete anterior rotation has occurred. If the head is on the pelvic floor for one hour or in sight for one-half hour without any noticeable progress, it is a good plan to apply outlet forceps. The pelvic outlet may be contracted either in the transverse or anteroposterior diameter. Three of this series necessitated forceps deliveries for slight degrees of pelvic outlet contraction.

The condition of the mother and baby should be closely watched. With prolonged labor, often by the time the perineal stage is reached, the mother is too exhausted even to attempt spontaneous delivery. It is a good plan, following prolonged labors and with the reaching of the perineal stage, to apply forceps if the maternal pulse is found to be 120 or above between pains. An acceleration of the fetal heart rate is not of marked importance, providing a change in regularity does not occur; a slowing to 100 or below with or without the presence of meconium is a sign for immediate operative interference, if possible. The presence of meconium alone without a slowing of the fetal heart rate does not furnish an immediate indication for interference, but the case should be closely watched. All observations on the fetal heart rate should be made between uterine contractions.

The management of these cases is of prime importance. The parturient patient is always thankful for the skill and interest of the attending obstetrician in attempting to make labor as pleasant and painless and safe as possible. As soon as the patient goes definitely into labor, a cleansing soap suds enema should be given. During the first stage she may be up and about. It is best to be on a liquid diet during this time. Attention should be given to the bladder. The patient should be catheterized as often as every six or eight hours, if unable to void. The mother's general condition, especially the pulse and blood pressure, should be watched closely and the condition of the fetal heart noted at intervals of one to two hours. A complete urine analysis should be made.

The matter of pain. A large percentage of the multiparae go through labor easily and deliver spontaneously, requiring no relief or occasionally only a 1/6 to 1/4 gr. of morphine with 2 c.c. of 50 per cent magnesium sulphate. Those having hard and prolonged labor may be given rectal anesthesia, following the Gwathmey technic; this may be repeated if necessary but without repeating the morphine. In primiparae rectal anesthesia may be given, except in those cases with slow dilatation, prolonged labor and insufficient pains. In this type of case morphine-scopolamine anesthesia may be used, starting at two fingers dilatation and repeated every three to four hours so as to keep the patient in a seminarcotized state. Usually only one initial dose of morphine is given, the following injections being only scopolamine. Two cubic centimeters of 50 per cent magnesium sulphate may be added to the initial injection as it seems to prolong the action of morphine.

If after twenty-four to thirty-six hours of active labor the cervix is not dilated beyond two fingers, it is permissible to insert a Vorhees bag, a number four if possible, to complete the dilatation. This usually displaces the head but no harm is usually done in displacing an occiput posterior position. If the membranes are intact, delivery may be completed by podalic version, following the expulsion of the bag and the dilatation of the cervix; if the membranes are ruptured, then delivery must be completed by forceps. It was only necessary to treat one case in this series with a bag insertion, delivery being completed by midforceps.

During the latter part of the first stage and the entire second stage, nitrous oxide analgesia may be given with each pain, continuing three to four hours, if necessary, without any harm to either the mother or baby. Nitrous oxide is quite often sufficient for the perineal stage, especially after the administration of morphine-scopolamine or rectal anesthesia. Ethylene or ether anesthesia may be used.

With spontaneous anterior rotation the case assumes the character of the usual occiput anterior position. If posterior rotation occurs and delivery is spontaneous with the face to the pubes, deep tears often result, especially in primiparae unless a deep episiotomy is done.

The type of episiotomy done in this series was a left mediolateral of varying depth, repairing the muscles in layers with twenty day chromic catgut, and closing the vaginal mucous membrane and skin with a subcuticular suture. The deeper lacerations were repaired in a similar manner.

In this series lacerations of the pelvic floor were present as follows:

First degree	40	20.0 per cent
Second degree	22	11.0 per cent
Third degree	2	1.0 per cent
Episiotomy	41	20.5 per cent
Total	105	52.5 per cent

The two third degree lacerations severed the sphincter ani muscle but did not penetrate the rectal mucosa. One followed a difficult midforceps delivery, the other a version and extraction of a 4200 gram baby.

In considering the operative delivery of occiput posterior positions we have a choice of several procedures, namely, forceps, version, cesarian section and craniotomy. The most commonly used method is forceps delivery and may be either high, mid or low forceps, using either the Simpson, McClain, Tarnier axis traction or Kielland forceps. In primiparae episiotomy is usually indicated along with the forceps delivery.

We have also the various stations and degree of engagement of the head to consider which may be grouped as follows:

Group I. Occiput engaged well below the spines of the ischium with the head resting on or near the pelvic floor.

Group II. Occiput engaged at the spines of the ischium.

Group III. Occiput not engaged with the head at the pelvic brim.

The following conditions must be fulfilled before delivery by forceps or version is attempted, namely the so-called A.B.C.D. of operative deliveries.

A. Anesthetic. Nitrous oxide-ethylene or nitrous oxide-ether anesthesia.

A. Amnion. The membranes must be ruptured.

B. Bladder. The patient must be catheterized at time of delivery.

B. Bowels. A cleansing enema should have been given several hours prior to delivery.

C. Cervix. The cervix must be completely dilated, effaced and retracted about the head.

D. Dystocia. There must be no disproportion between the mother's pelvis and the size of fetus.

The easiest forceps procedure is a low forceps delivery, following complete anterior rotation of the occiput to one of the anterior quadrants with the head resting on or near the pelvic floor. The case then becomes a simple outlet forcep delivery, such as would occur with a similar primary anterior position.

The procedures used, if the occiput is well engaged with the head on or near the pelvic floor (group I) but does not rotate anteriorly, in the order they would be used are as follows: (1) Attempt at forceps delivery with face to pubes, (2) attempt at manual rotation to anterior position followed by forceps delivery, (3) attempt at forceps rotation to anterior position followed by forceps delivery, (4) podalic version and breech extraction, (5) craniotomy and extraction.

The procedures used when the head lies in midpelvis and the occiput has rotated to the hollow of the sacrum or is still at the original 135° position (group II), would be similar to those for group I, except for the omission of the attempt at forceps delivery with the face to the pubes.

In this group an attempt may first be made to rotate the head manually through an arc of 135° to an anterior position. It is usually necessary to dislodge the head from the soft parts by first pushing it up and then rotating. Following successful rotation the forceps are then applied. If a right occiput position, the right blade is applied first; if a left position, the left blade is applied first in order to prevent rotation of the head back to the original posterior position. Delivery is then accomplished by forceps traction, being careful to maintain flexion and taking sufficient time, providing the condition of the mother and baby is good.

If manual rotation is unsuccessful, forceps rotation may be tried followed by forceps delivery. The Scanzoni maneuver may be used, in which rotation is accomplished when the head reaches the pelvic floor; the forceps are then removed and reapplied before completing the delivery. The method of Bill may be used, in which early in the second stage the head is first rotated at whatever station of the pelvis it may lie, the forceps reapplied, and delivery then accomplished by traction from the new anterior position. The Kielland forceps are of use in this condition. With one application and with combined rotation and traction, attempted first at the spines, and if unsuccessful, above the spines, delivery is often easily accomplished.

In the position of deep transverse arrest the forceps are applied in the oblique diameter of the pelvis, the left blade over the anterior malar bone and the right over the posterior parietal bone if a right transverse position. Delivery is then effected by combined traction and rotation, the blades being reapplied to the biparietal diameter when the sagittal suture has rotated to the anteroposterior plane. The Kielland forceps may also be used in this condition, the anterior blade being applied first, followed by the posterior blade so that the forceps occupy the midsagittal diameter of the pelvis and are directly applied to the biparietal diameter of the baby.

Podalic version has its field of usefulness in occiput posterior positions, especially in those cases coming under group III. Many difficult or impossible forceps cases become the easiest and most successful versions. When forceps delivery fails or the head is high in the pelvis or displaced following bag insertion, then version is indicated, only provided that the membranes are either still intact or the amniotic fluid has not completely drained away. The success of version in these cases is probably due to the changing attitude of the child, there often being a peculiar or unfavorable attitude or deflexion present in occiput posterior positions. Many operators prefer to do versions without a trial of forceps as soon as an occiput posterior is recognized. Potter does versions on all cases.

When both forceps and version fail, then it becomes necessary to do a craniotomy and extraction. In exceptionally rare cases a pubiotomy may be indicated.

The detailed method of termination of the cases of this series occurred as follows:

Spontaneous rotation, spontaneous delivery	130	65.0 per cent
Face to pubes, spontaneous delivery	23	11.5 per cent
Spontaneous rotation, forceps delivery	22	11.0 per cent
Manual rotation, forceps delivery	4	2.0 per cent
Forceps rotation, forceps delivery	13	6.5 per cent
Face to pubes, forceps delivery	5	2.5 per cent
Version and extraction	3	1.5 per cent

SUMMARY

1. Two hundred consecutive occiput posterior positions are presented and classified with the resulting morbidity and mortality to both the mother and baby.

2. The diagnosis, course, management and operative treatment of these cases, with special reference to the x-ray diagnosis, has been considered.

3. The following plan is suggested for the proper termination of these cases:

a. Make a correct and early diagnosis.

b. Resort to an x-ray diagnosis when necessary.

c. Allow plenty of time for rotation to occur, the cervix to dilate and the head to descend.

d. Interfere with the correct operative procedure at the proper time whenever necessary in the best interests of the mother and baby.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington and Idaho
Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

OCTOBER, 1928

EDITORIAL

HEART STRAIN

While it has been recognized for some time by certain observers that one excessive individual muscular effort may produce permanent organic injury of heart or aorta, this fact has not been commonly recognized by the profession at large. A recent report by Kahn and Kahn* details a group of cases of men accustomed to laborious work, each of whom sustained such prolonged or permanent injury, following the strain produced by a single extreme exertion. Nearly all of them experienced this damage while lifting an excessive weight. The attending symptoms were severe pain in region of the heart or behind the sternum, marked weakness or immediate unconsciousness, incapacitating dyspnea and cardiac palpitation. Some cases have been reported where death followed immediately after such an exertion. While this condition of heart strain is believed in some cases to have arisen in hearts in normal condition so far as could be ascertained, probably in most cases there was previously some organic lesion unknown or unrecognized. Physical signs discovered after the injury have been variously reported. A small, feeble and rapid pulse have generally been observed, frequently irregularity with extrasystoles, sometimes paroxysmal tachycardia or auricular fibrillation. There may be other states of arrhythmia and commonly elevated blood pressure. A most striking feature in these cases is the disability of a previously supposed ablebodied man. A period of one year of total disability may be anticipated, during which the patient must rest completely, followed by another year of partial disability, when he can do only light work. In more severe cases the disability may be total and permanent in spite of the customary treatment of cardiac stimulation and other accepted procedures. The relation of heart strain to industrial compensation claims has called especial attention to this condition. Competent observers recognize that this may be a legitimate cause for compensation, and must be kept in mind by those engaged in industrial practice.

THE GORGAS MEMORIAL ANNIVERSARY

An anniversary of the birthday of Dr. William C. Gorgas has been scheduled for October 3 at Chicago by the Gorgas Memorial, which will be attended by representatives of this organization from all parts of the country. The specially important announcement is to the effect that a leading scientist in tropical medicine is to be selected to take charge of the laboratory in Panama for the study of tropical diseases, which has been made possible by an annual appropriation by the United States Government of $50,000, which is to be supplemented by grants from about twenty South and Central American countries. The Panama Government has designated for this purpose a building recently erected for a proposed school of medicine. The use of this building will enable the Memorial officials to institute the research campaign soon after November first. In addition to work in this field of research, the Memorial will continue its campaign in this country, stressing the periodical health examination and the effort to promote public support of scientific medicine.

A SUPERIOR PORTLAND MEETING

The best meeting which the society has held in many years was the unanimous opinion of all who attended the annual meeting of the Oregon State Medical Society, held at Portland last month. The especially pleasing feature of the program was the fact that the presentation of papers was confined entirely to members of the society and there were no attractions from outside members of the profession. A large attendance was recorded from all parts of the state. Each session presented a full program of from six to eight papers, all of which were read and discussed to a greater or less extent. It was noticeable that the majority of these papers were prepared by the younger men of the profession, many of whom had never before appeared before a state meeting. This is evidence that, when the time comes for the retirement of the old guard, medical work of the state will be continued as efficiently if not more so than in the past. The papers evinced ardent work on the part of the authors, with earnest research by some and evidence of original investigations that will demand attention from the profession at large.

A spirit of cooperation and universal friendliness was apparent which augurs well for the progress and development of the medical profession of Oregon. When the striking increase of dues was established a few years ago, some were inclined, with pessimistic predictions, to foretell disaster in coming years. The large present membership in the society and the progress which it has made as a body has proven the error in these predictions. With other work of the society accomplished, its comfortable bank balance affords a feeling of security and the ability to accomplish desired results, which seem fully to justify the foresight of the members who labored to establish the existing financial condition of the organization.

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* Kahn, M. H., and Kahn, Samuel: Heart Strain in Its Industrial Aspects. Am. Hrt. Jour., III, 546, June, 1928.

Much interest and discussion centered about the meeting of the American Medical association in Portland next summer. The Portland profession has undertaken a large project in staging this gathering. It will demand hard work on the part of committees and financial contributions from many members of the profession to meet the required expenditures. It is believed, however, that if each individual undertakes an adequate part of the expense that it can be carried on to a successful issue with no undue burden on anyone. The medical profession should appreciate the sacrifice which will be made by the Portland physicians in bringing to this section this greatest of medical gatherings. Every practitioner in the Pacific Northwest should make his plans to be present as long as possible at this great meeting. Such an opportunity may not come to their doors again for a period of years. Let us all appreciate the opportunity and take advantage of it.

MEDICAL NOTES

Observe Advertisers' Coupons. We wish to call attention of readers to advertisements with attached coupons which may be clipped and mailed to the respective advertisers. On receipt of these, samples of th eadvertised goods will be sent. Mention is made of the following: Knox Gelatine Laboratories, page 31; Patch's Cod Liver Oil, page 23; Frank Betz Co., page 23; Hanovia Chemical and Manufacturing Co., page 5; McIntosh Electrical Corporation, page 21; Petrolagar, page 10; Nonspi Company, page 12.

Watch for This Imposter. A man, giving the name of J. R. Robinson, has been consulting physicians in some cities of Washington, and will probably visit more of them as well as those in Oregon, if he is not apprehended and checked in his career. He consults urologists and ophthalmologists, complaining of venereal disease and disturbance of vision, with both of which he is said to be afflicted. His special stunt is to present a check purporting to be given him by his father for the payment of glasses and treatment. When he collects the change from his victim he does not return for further treatment. He is about 28 years of age, well dressed, of good address, dark hair, height about five feet nine inches, weight about 160 pounds. Be on the outlook for this imposter and get him in the clutches of the law if possible.

OREGON

Gorgas Memorial Lecturer Speaks. Dr. J. B. Kane of the Gorgas Memorial Institute, Chicago, delivered an address before members of the Portland Rotary Club recently. His topic was the relation of disease prevention to longevity.

Resigns From Child Health Demonstration. Dr. William DeKleine, of Salem, who has served since November last in the capacity of director of the Marion County Child Health Demonstration, has resigned from that position in order to accept a position as director of health service for the American Red Cross. Dr. Estella Ford Warner will serve as acting director of the demonstration.

Health Institute. Dr. Phillip J. Jacobs, New York, publicity director of the National Tuberculosis Association, was one of the principal speakers at the community health institute held at Portland Sept. 15.

Viennese Physician Is Visitor. Dr. Richard Daldapfel of Vienna, Austria, who is professor of otolaryngology in that city, recently visited Dr. E. V. Ullman of Corvallis. The two physicians were formerly associates in clinical work at Vienna.

Central Willamette Valley Medical Society entertained Dr. Frank W. Lynch of San Francisco, Calif., professor of obstetrics at the University of California Medical School, at a meeting in Eugene Aug. 30. Following a dinner given in his honor, Dr. Lynch read a paper entitled "Uterine Fibroids."

Jackson County Medical Society held its opening fall meeting at the home of Dr. Ernest A. Woods in Ashland. The evening was devoted to a discussion of clinical cases. Dr. P. L. Heitmeyer of Astoria is president of the society.

Dr. William P. Sharkey of Portland has returned home, following a year devoted to graduate study in Europe. His time was principally spent in Vienna and Dublin.

Dr. John G. Manning, a graduate of Washington University Medical School, St. Louis, Mo., has located at McMinnville, where he will be associated in practice with Dr. Moyt W. Kerr.

Dr. Alva D. Walker of Portland recently submitted to a serious operation at St. Vincent's hospital at Portland.

Dr. R. E. Wimer, formerly of Pendleton, has moved to Salem where he will engage in practice.

WASHINGTON

Correction of Error. In our last issue it was stated that Dr. George Davis of Kirkland had moved to Amity, Ore. It was Dr. George A. Davis from

Redmond who made this change of residence. Dr. George H. Davis continues to practice in Kirkland.

Marine Hospital Site Offered. The Seattle City council, in reply to the proposition made recently by officials of the United States Public Health Service that the city donate a site for a proposed new regional marine hospital, passed a resolution Aug. 20, in which a twelve acre tract of municipally owned land was offered for the purpose. This site, which is valued at $100,00,0 is located on the north end of Beacon Hill, close to the business and waterfront districts, and has a commanding view of the city and Puget Sound. Seattle's offer, together with the recommendation of Surgeon L. D. Fricks and Surgeon-General H. S. Cummings of the Public Health Service who have investigated the property, has been forwarded to Secretary of the Treasury Andrew Mellon for official action by President Coolidge. Officials of the Public Health Service have assured the Seattle City Council that the offer will be accepted, federal money being already available for that purpose. It is proposed to erect a $3,500,000 modern hospital capable of caring for 350 patients, this to be enlarged at a later date. The present Port Townsend Marine Hospital will be retained for chronic cases.

Hospital Proposed for Lewis County. Mayor Polley of Morton, together with many public spirited citizens of Eastern Lewis County, is endeavoring to interest citizens of local towns in a community hospital for that district. At present patients must be transported thirty to sixty miles for hospital care, and in many cases this added risk seriously handicaps their chances for recovery.

Whatcom County Medical Society held its first Fall meeting Sept. 4 at the Chamber of Commerce rooms at Bellingham. Dr. S. H. Johnson reported on the address on intestinal obstruction which was given by Dr. Dean Lewis of Baltimore, Md., at the recent Washington Medical Association meeting at Seattle. Dr. P. J. Bilodeau reported a case of ectopic gestation, while Dr. A. P. McCalla described a patient having Landry's paralysis.

Maniac Attacks Physician. A violently insane patient at the Medical Lake State Asylum on Sept. 15 attacked Dr. G. E. Williams, of the hospital medical staff. The physician, who has been connected with the asylum for only two weeks, was so severely cut about the face and body that he had to be taken to St. Luke's Hospital at Spokane. He has since been reported out of danger.

Will Study in Europe. Dr. Charles T. Watts of Seattle, together with Mrs. Watts, sailed late in September for Europe, where he will spend several months in study and travel in England and on the Continent.

Dr. E. M. Adams, formerly of Arlington, has completed a course in urology at the New York Postgraduate Medical School Hospital, New York. He will return to Everett in November, where he will engage in the practice of urology.

Dr. N. A. Johanson of Seattle has returned from a summer tour of European medical centers. While in London he attended the International Conference for the Prevention of Cancer.

Dr. Lee W. Paul of Ilwaco has disposed of his practice at that place, where he has been located for twenty-two years. He will be succeeded by Dr. D. M. Strang, who formerly practiced at Sprague. Dr. Paul intends shortly to go to New York to engage in postgraduate study.

Dr. Robert P. De Riemer of Spokane has returned to his home city, where he will engage in practice. Following his graduation from the University of Pennsylvania medical school, Philadelphia, he served last year as resident physician at the University Hospital.

Dr. Chas. E. Van Mason, a practicing physician for many years at Cincinnati, Ohio, has located at Des Moines.

Dr. John J. Durkin of Los Angeles, Calif., has opened an office at Tacoma.

Dr. Homer G. Miller, who has been practicing at Eatonville, has moved to Port Townsend.

Wedding. Dr. John F. Le Cocq of Seattle and Miss Florence Barbour of Mason City, Iowa, were married at Mason City Sept. 22.

IDAHO

Attends Army School. Dr. George C. Halley of Twin Falls left last month for Carlisle, Penn., to attend the six weeks course of the United States Army medical school. While in the East he will go to Baltimore, Md., in order to participate in the annual session of the Association of Military Surgeons of the United States.

New Intern at Idaho Falls. Dr. Meyer Mades, formerly of Chicago, Ill., has succeeded Dr. Alfred Peters as intern at the Latter Day Saints Hospital at Idaho Falls.

Doctor's Home Burns. Fire of unknown cause almost destroyed the home of Dr. Harmon Tremaine, Boise pediatrician, Sept. 3.

Dr. H. D. Junkin of Idaho Falls has returned from a summer tour of Europe.

Dr. R. C. Ward of Cascade has disposed of his practice at that place to Dr. J. E. Otto, formerly of Grace.

Health Officer Appointed. Dr. T. W. Laraway has been appointed health officer of Elk River.

OBITUARIES

Dr. John B. McNerthney, for the past twenty-seven years a prominent physician and surgeon of Tacoma, Wash., died suddenly at his home Sept. 19, aged 54 years. He was born at Wamadee, Wis., in 1874, and graduated from the University of Minnesota medical school in 1899. Following two years spent in practice in Minnesota he moved to Tacoma in 1901. Later he was joined by a brother, Dr. William B. McNerthney, who survives him. He was active in local medical circles and was a charter member of the Tacoma Surgical Society. He served a term as president of the Pacific Surgical Society.

Dr. Robert J. Conroy, Medford, Ore., died in a hotel room at Salt Lake City, Utah, Sept. 13, aged 60 years. He was returning from Ontario, following a visit to his aged mother when his last illness overtook him. He was born in 1868 in Ontario, and was a graduate of McGill University Faculty of Medicine, Quebec, in the class of 1900. He had practiced at Medford for many years.

Dr. John Johnston, Ritzville, Wash., died at the Sacred Heart Hospital in Spokane Sept. 12, aged 61 years. He was born in Port Arlington, Ireland, in 1867 and came to the United States in his youth. He graduated from the University of Pennsylvania school of medicine in 1898, and located in Ritzville twenty-six years ago. He was the oldest practicing physician in Adams County.

Dr. David Wilbur Vail, Seattle, Wash., died at his home Aug. 28, aged 81 years. He was born in 1847 and graduated from Western Reserve University medical school in 1869. His years of active work were passed in Cleveland, Ohio. He came to Seattle in 1926, but was not engaged in practice there on account of his advanced age.

Dr. J. S. Church, La Conner, Wash., died at his home Sept. 9, following a lingering illness, aged 80 years. In 1870 he located in Port Gamble, Wash., and practiced there and in Seattle until 1922 when he moved to Skagit County. He practiced for many years in La Conner, where he was active in civic affairs.

Dr. Richard Emil Mohrmann, Spokane, Wash., died suddenly Sept. 14 at Tacoma while on a vacation, aged 59 years. He was born in Germany in 1869. He practiced for a time in Bellingham, Wash., before locating in Spokane about fifteen years ago.

REPORTS OF SOCIETY MEETINGS

WASHINGTON STATE MEDICAL ASSOCIATION

MINUTES OF THE THIRTY-NINTH ANNUAL MEETING OF WASHINGTON STATE MEDICAL ASSOCIATON, HELD AT OLYMPIC HOTEL, SEATTLE, WASH., AUGUST 27-30, 1928

The Thirty-ninth Annual Meeting of Washington State Medical Association was convened at the Olympic Hotel, Seattle, August 28, 1928.

THE HOUSE OF DELEGATES

First Session

Tuesday, August 28

The House of Delegates was called to order by Vice-President Dr. Brush, at 9:00 a.m. The roll was called, a quorum being present. The following delegates were present:

Dr. R. J. O'Shea, Dr. F. H. Brush, Dr. C. H. Thomson, Dr. J. H. O'Shea, Dr. D. A. Nicholson, Dr. H. J. Whitacre, Dr. C. A. Hagyard, Dr. D. H. Houston, Dr. C. L. Smith, Dr. P. J. Gallagher, Dr. E. E. Hill, Dr. Geirge Anderson, Dr. L. S. Roach, Dr. G. W. Swift, Dr. A. H. Peacock, Dr. H. E. Coe, Dr. F. T. Maxson, Dr. W. W. Bell, Dr. C. R. Castlen, Dr. W. B. Penney, Dr. H. G. Willard, Dr. W. D. Read, Dr. A. J. Helton, Dr Frederick Epplen, Dr. C. R. Mowery, Dr. A. Betts, Dr. R. N. Hamblen, Dr. J. T. Rooks.

Motion made and adopted that minutes of previous meeting be accepted as published in Northwest Medicine.

The secretary stated that it was customary to have the books examined by a certified public accountant on January 1 and July 1 of each year, and that there had been two audits since the last annual meeting, abstracts of which are printed on the program.

LEGAL DEFENSE FUND

To the Officers and Members
The Washington State Medical Association,
Seattle, Washington.
Gentlemen:

Pursuant to your request, we have audited the books and records of the Washington State Medical Association for the six months ending June 30, 1928, and now present our report. As a part of this report, we have prepared and attach herewith the following exhibits:

Medical Association Fund	Exhibit "A"
Legal Defense Fund	Exhibit "B"
Disbursements, M. A. F.	Exhibit "C"
Disbursements, D. D. F.	Exhibit "D"
General Receipts	Exhibit "E"
Recapitulation Statement	Exhibit "F"

In addition to and in explanation of the information contained in these statements, we wish to make the following comments:

MEDICAL ASSOCIATION FUND

Receipts from membership dues for this period have amounted to $4,090.00, being remittances from 818 members, 755 of these were for 1928 dues, 60 for 1927, 3 for 1926. We have also certified this fund with 50 per cent of the General Receipts, shown by Exhibit "E," $226.97, making a total receipts of $4,316.97 credited to this fund. Disbursements for the period have amounted to $2,859.03 as shown by Exhibit "C," therefore showing an increase in this fund of $1,457.94. This amount added to your January 1 balance of $7,108.57 gives you a balance to the credit of this fund of $8,566.51 as at June 30, 1928.

Financial Report

Receipts from subscribers to this fund have amounted to $2,690.00 for the period or 269 subscriptions. We have also credited this fund with 50 per cent the General Receipts, as shown by Exhibit "E"—$226.98, making a total receipts to this fund of $2,916.98. Disbursements have amounted to $1,607.08 for the period, as shown by Exhibit "D," a net increase credit to this fund of $1,309.90. This amount, added to your January 1 balance of $1,206.01, gives you a net balance of $13,335.91 to the credit of this fund as at June 30, 1928.

RECAPITULATION STATEMENT

This exhibit shows a total receipts from all sources of $10,705.95. Disbursements, $7,371.61, a net increase of $3,334.34 for the period. This amount, added to your January 1 balance of $19,134.58, less the decrease in cost of securities bought over those sold, $566.50, gives you a balance, cash and securities, in the hands of your Treasurer as at June 30, 1928, of $21,902.42, this balance being made up as shown by Exhibit "F."

GENERAL

The bank balances have been satisfactorily reconciled. The bonds and securities were inspected, all unpaid coupons being attached. All disbursements have been made by voucher check, drawn on your regular depository; have been properly endorsed and cleared through the bank in regular order. Invoices from parties to whom payment was made are properly O. K'd. and are on file, or payments authorized by the by-laws of the Association.

CERTIFICATION

WE HEREBY CERTIFY that the attached Exhibits, together with the foregoing comments, are in agreement with your books, and in our opinion are correct and show the true condition of the two funds as at June 30, 1928, and the correct amount of receipts and disbursements for the six months ending that date.

Respectfully submitted,
Louis E. Smith & Co.

On motion the audit was accepted as published.

It was moved that the reports of the committees as published in the program be accepted.

Seconded and adopted.

The minutes of the last meeting of the Board of Trustees were read and adopted.

Dr. D. A. Nicholson read the following report on the proposed reorganization:

The President,
Washington State Medical Society,
Seattle.

Dear Doctor:

At the last annual meeting a motion was adopted directing the President to appoint a committee to formulate and recommend for adoption at a subsequent meeting of the House of Delegates amendments to the by-laws, providing for the formation of seven or more or less districts with trustees, whose function it will be to organize and represent their respective districts.

This committee wishes to report that in order to carry out this plan it will be necessary very materially to change the by-laws of the Washington State Medical Association as regards the present Board of Trustees, their duties and the duties of the House of Delegates. If we are to create new districts with trustees to represent them, no doubt you will wish to follow the constitution and by-laws as recommended by the American Medical Association, wherein counselors are elected from the profession at large and whose duty it is to represent certain districts, settle disputes in their districts, visit County Societies in their districts, etc.

At present our society is divided into two districts, a Western and an Eastern one. The Eastern district has three hundred fifteen members with four trustees elected from that section, and the Western district has eight hundred forty-four members with four trustees elected from that section. To create more districts would mean subdividing the Eastern and Western Districts and whether you would wish to do this on the basis of population or mileage is a question. The Eastern district at the last census has approximately 452,000 population and the Western district approximately 985,000. Naturally the large population is in three counties, Spokane, Pierce and King. Are these to be made separate districts, are they to be subdivided, or do you wish to take in other counties with them?

The whole problem appeared to us so uncertain that we hesitate to make any recommendations as to plans, preferring to let the House of Delegates understand more fully the proposed subdivision, the objects of the same, and then consider the present plan which is less complicating and we believe more practical for our State to continue in. But if the society decides to adopt the other method, then the by-laws are already covered in the attached sample of the constitution and by-laws.

Respectfully yours,
D. A. Nicholson.

After discussion motion was adopted that the committee be continued and report at some subsequent meeting.

Amendment to By-Laws

The Secretary then offered the following amendment to the by-laws: Amendment Article IV, Sec. 5 (b) to provide that the School of Graduation shall be one recognized by the American Association of Medical Colleges.

This amendment was laid on the table until the next meeting.

Motion was adopted that the by-laws be brought up-to-date, published and issued to the members.

Dr. J. H. O'Shea, Chairman of the Industrial Relations Committee, made a motion that a committee be appointed to investigate the advisability of this Association recommending such legislation as will bring about examination of employees before employment.

After discussion the motion was adopted and referred to the Committee on Industrial Relations.

The report of the committee appointed by the trustees to investigate the question of the consultation of members with irregular practitioners was called for and postponed on account of the absence of the chairman, Dr. H. J. Whitacre.

In regard to Legal Defense, the motion was adopted to appoint a committee to investigate applicants for defense; this committee to be composed of the Executive Committee of the State Medical Association and of the President and Secretary of the County Society in which the applicant resides.

Motion made and adopted that name of Committee of Hospital Standardization be changed to Committee of Hospital Survey.

The House of Delegates then adjourned until Thursday morning.

Second Session

Wednesday, Aug. 29

The house of Delegates was called to order by the President, Dr. R. J. O'Shea, at 9:00 a.m.

The roll was called and a quorum found to be present.

The minutes of the last session were read and adopted.

The House then proceeded to select a meeting place for 1929. Invitations were received for Yakima, Walla Walla, Aberdeen, and Port Angeles. The ballot being taken, the invitation to meet in Yakima was accepted.

The following officers were elected: (Those whose terms did not expire are added to complete the list.)

President, Dr. F. H. Brush, Yakima, term expires 1929.

First Vice-President, Dr. A. E. Anderson, Aberdeen, term expires 1929.

Second Vice-President, Dr. J. P. Schutt, Bremerton, term expires 1929.

Secretary-Treasurer, Dr. C. H. Thomson, Seattle, term expires 1931.

Assistant Secretary-Treasurer, Dr. J. H. O'Shea, Spokane, term expires 1931.

Trustees—

First District: Dr. C. A. Hagyard, Seattle, term expires 1929; Dr. D. H. Houston, Seattle, term expires 1929; Dr. S. L. Caldbick, Everett, term expires 1930; Dr. D. C. Hall, Seattle, term expires 1930.

Second District: Dr. E. E. Hill, Walla Walla, term expires 1929; Dr. George Anderson, Spokane, term expires 1929; Dr. C. L. Smith, Spokane, term expires 1930; Dr. P. J. Gallagher, Spokane, term expires 1930.

Journal: Dr. George Dowling, Seattle, term expires 1930; Dr. E. W. Janes, Tacoma, term expires 1930; Dr. Mitchell Langworthy, Spokane, term expires 1930.

Delegates to A. M. A.: Dr. J. H. O'Shea, Spokane, term expires 1929; Dr. Arthur Betts (alternate), Spokane, term expires 1929; Dr. Frederick Epplen, Seattle, term expires 1930; Dr. D. E. McGillivray (alternate), Port Angeles, term expires 1930.

Dr. Wilson Johnson and Dr. Joseph Petit of Portland spoke in regard to the A. M. A. Convention to be held there next year.

Dr. West of Everett adressed the House on the matter of securing money owing the physicians from the Department of Labor and Industries. After discussion, motion was adopted that the matter be turned over to the Industrial Relations Committee and that they be given authority to act.

The House of Delegates then adjourned sine die.

PROGRAM

Monday, August 27

Washington State Medical Association Gold Tournament and Dinner at Inglewood Country Club.

SCIENTIFIC PROGRAM

Tuesday, August 28

9:00 a.m. Board of Trustees and House of Delegates.

Reports of officers and committees.

9:00 a.m. Urological Section.

"Stricture of the Female Urethra," Dr. A. Anderson, Aberdeen.

"Review of Cases of Diverticulum of the Urinary Bladder," Dr. Chas. Edmund Teel, Bellingham.

"The Collings Operation." Dr. C. F. Engels, Tacoma.

"The Operative Treatment of Urethral Stricture." Dr. A. Hepler, Seattle.

"Perinephritic Abscess." Dr. Alexander Peacock, Seattle.

2:00 p.m. Orthopedic Section.

"Shoes" (Lantern Slides). Dr. Joe Brugman, Seattle.

"The Problem of Ankylosed or Partially Ankylosed Joints." Dr. C. F. Eikenbary, Seattle.

"Treatment of Injured Spines" (Lantern Slides). Dr. R. Anderson, Seattle.

"Treatment of Fractures of the Extremities by the Three-Piece Plaster-of-Paris Cast." Dr. D. A. Murray, Seattle.

"Injuries to the Spine in the Cervical Region." Dr. M. Langworthy, Spokane.

Wednesday, August 29

10:00 a.m. "Pyelonephritis." Dr. Arthur H. Crosbie, Boston, Mass.

Discussion opened by Drs. F. H. Brush, Yakima; A. H. Peacock, Seattle; C. E. Teel, Bellingham; Charles Butts, Spokane.

"Diagnostic Methods in Proctology for the Surgeon and the Internist." Dr. Louis A. Buie, Mayo Foundation.

Discussion opened by Drs. C. A. Hagyard, Seattle; Geo. C. Miller, Seattle; A. J. Helton, Yakima; H. D. Dudley, Seattle.

2:00 p.m. "Intestinal Obstruction." Dr. Dean Lewis, Johns Hopkins Hospital.

Discussion opened by Drs. A. A. Mathews, Spokane; C. W. Sharples, Seattle; H. J. Whitacre, Tacoma; J. C. Lymans, Walla Walla.

"Uterine Fibroids. A Study of 625 Cases." Dr. F. Lynch, University of California Hospital.

Discussion opened by Drs. W. D. Kirkpatrick, Bellingham; A. E. Gerhardt, Wenatchee; C. A. Ward, Spokane; W. C. Woodward, Seattle.

7:00 p.m. Annual Banquet — Spanish Ballroom, Olympic Hotel.

Thursday, August 30

9:00 a.m. House of Delegates. Election of Officers, etc.

10:00 a.m. "The Surgical Lesions of Bone." Dr. Dean Lewis, Johns Hopkins Hospital.

Discussion opened by Drs. M. Langworthy, Spokane; S. L. Caldbick, Everett; L. L. Goodnow, Aberdeen; W. A. Taylor, Ellensburg.

"Heredity." Prof. Trevor Kincaid, University of Washington.

12:00 a.m. Annual Meeting and Luncheon of Public Health League of Washington.

2:00 p.m. "Medical and Surgical Treatment of Ano-Rectal Disesaes." Dr. Louis A. Buie, Mayo Foundation.

Discussion opened by Drs. A. Crookall, Seattle; F. A. Bird, Olympia; J. H. O'Shea, Spokane; Elmer Hill, Walla Walla.

"Some Observations on Prostatectomy." Dr. A. Crosbie, Boston, Mass.

Discussion opened by Drs. O. A. Nelson, Seattle; C. F. Engels, Tacoma; A. B. Hepler, Seattle; J. T. Whitty, Seattle.

7:00 p.m. Dinner-Dance—Spanish Ballroom, Olympic Hotel.

IDAHO

IDAHO STATE MEDICAL ASSOCIATION

PROCEEDINGS OF THE THIRTY-SIXTH ANNUAL MEETING OF IDAHO STATE MEDICAL ASSOCIATION, YELLOWSTONE NATIONAL PARK, WYOMING, AUGUST 27-29, 1928.

Monday, August 27

The scientific meeting was called to order at 9:00 a.m. by President Alexander Barclay of Idaho State Medical Association, whose address was the first on the program.

"Emergency Surgery." Dean Lewis, Surgeon-in-chief, Johns Hopkins Hospital, Baltimore.

"The Treatment of Pelvic Infections." Henry Schmitz, Loyola University, Chicago.

"Treatment of Nonmalignant Lesions." Donald Balfour, Mayo Clinic.

The morning's program was finished by a very interesting talk on "Biological Chemistry," by W. J. Mayo.

Drs. Jabez N. Jackson, Morris Fishbein and P. B. Magnuson were absent.

Tuesday, August 28

Call to order.

President's Address. G. M. Jennings, president of the Medical Association of Montana.

"Splenomegalie in Childhood." Julian Hess, Chicago.

"The Differential Diagnosis and Treatment of Lesions of the Tongue." E. P. Zeisler, Chicago.

"Modern Advances of Ophthalmic Therapeutics." H. S. Cradle, Chicago.

"Head Injuries, Differential Diagnosis and Treatment." C. W. Hopkins, Chief Surgeon, Chicago.

Drs. P. M. Krall, of Kansas City, G. A. Soper, New York, and Frank Gregor, Indianapolis were absent.

"Treatment of Pregnancy in Patients with Diabetes." Russell Wilder, Mayo Clinic.

Wednesday, August 29

Call to order.

President's Address. A. P. Kimball, president of Wyoming State Medical Association.

"The Importance of the Simpler Physical Method of Diagnosis and Treatment." W. S. Thayer, Baltimore.

"The Relation of Abdominal Ptosis to Abdominal Gastrointestinal Function and Pain. Treatment." R. C. Coffey, Portland.

"The Surgery of Thyrotoxicosis." J. R. Buchbinder, Chicago.

"A Postoperative Review of One Thousand Operations for Goiter." C. A. Roeder, Omaha.

"The Variable Significance of Urinary Sugar." C. F. Kemper, Denver.

"Safer and More Effective Goiter Surgery." C. C. Tiffin, Seattle.

Dr. F. E. McCollum, Kansas City, was absent.

PROCEEDINGS OF THE HOUSE OF DELEGATES

First Session

August 27, 1928

Call to order at 7:30 p.m. by President Dr. Alexander Barclay.

The following members present:

Councilors: G. O. A. Kellogg, H. D. Spencer, D. E. Cornwall.

President, A. Barclay.

Secretary, J. N. Davis.

Canyon Co.: G. R. Proctor, V. C. Belknap.

Idaho Falls Co.: A. R. Soderquist.

Nez Perce Co.: O. F. Gist, J. N. Alley.

Pocatello Co.: W. F. Haword, E. N. Roberts, C. W. Pond.

Southwestern H. W. Stone.

South Side: D. L. Alexander.

Tri-County: F. C. Gibson.

Bonner Co.: F. B. Evans.

Upper Snake River: E. D. Jones.

Moved by Dr. Alley, seconded by Dr. Howard, that Dr. E. D. Jones of Upper Snake River Medical Society be seated as Delegate of that Society. Carried.

Minutes of 1927 annual meeting read and approved.

Following committees appointed by the chair:

Resolutions committee: F. C. Gibson, C. W. Pond, D. L. Alexander, J. F. Gist, E. N. Roberts.

Nominating committee: G. O. A. Kellogg, J. N. Alley, W. F. Howard, H. W. Stone, D. E. Cornwall.

Secretary's Report

Standing of Component Societies:

SOCIETY	MEMBERS
Bear Lake County	None
Bonner County	3
Canyon County	17
Idaho Falls	13
Kootnai County	7
Nez Perce County	14
Pocatello	30
Shoshone County	6
Southwestern Idaho	21
South Side	23
Tri-County	15
Upper Snake River	9
	158

Of this number one is reported no good and was not and probably will not be passed by the Tri-County Medical Society.

Since this report, seven reinstatements have been received and two new members who have not been passed by their County Medical Society. Of the above number four have paid only $10.00 fee.

In view of the standing of the Bear Lake County Medical Society I recommend that their charter be withdrawn and the county attached to the Pocatello Medical Society.

I further recommend that District Medical Societies be organized in accordance with the Constitution and By-Laws of the State Association.

J. N. Davis,
Secretary-Treasurer.

Report requested of standing committees:

Committee of Public Health and Legislation: There being no legislature during this year the committee reports no activity.

Committee on scientific work report the program as evidence of their work.

Dr. F. D. Stricker, Secretary of the Oregon State Medical Society, was invited to explain the workings of their Public Health League in conjunction with the State Medical Society.

Adjourned to meet August 28.

Second Session

August 28, 7:30 p.m.

Call to order by chairman, Dr. Alexander Barclay.

Roll call. Following members present: Kellogg, Spencer, Cornwall, Barclay, Davis, Proctor, Kelknap, Soderquist, Alley, Howard, Roberts, Pond, Stone, Alexander, Leete, Gibson, Evans, Jones.

Moved by Dr. Howard, seconded by Dr. Alexander that the Idaho State Medical Association request and thereby authorize the wives of members to organize an auxiliary. Carried by unanimous vote.

Report of Executive Secretary

FINANCIAL STATEMENT MADE TO THE IDAHO STATE MEDICAL ASSOCIATION AS OF AUGUST 22, 1928

Cash on hand Jan. 1, 1928		$ 382.59
Receipts:		
1927 dues	$ 6.00	
1928 dues	7,500.00	
Paul Davis, Loan	250.00	
	$7,756.00	
		$7,756.00
Total available money to date		$8,138.59
Expenditures:		
Legal fund	$ 22.50	
Secretary, salary	2,825.00	
A. M. A. Delegate	50.00	
Stenographer, salary	643.75	
Rent, (to Aug. 1)	210.00	
Misc. charges	$1,382.48	
	$5,133.73	
Total expenditures to Aug. 22, 1928		$5,133.73
Balance on hand as per my books 8/22/28		$3,004.86
Actual bank balance 8/22/28		2,979.40

A few small checks have not become due; $20.00 worth of "Bum" checks and a small amount outstanding account for the difference.

Balance on hand is divided as follows:

General fund	$2,415.11
Legal fund	437.50
Medical defense fund	119.25
Balance due local societies	33.00
	$3,004.86

Miscellaneous account charges include the following: Telephone and telegraph; printing and stationery and supplies; janitor; traveling expenses; local society refunds, etc.

J. N. Davis,
Secretary-Treasurer.

Election of Officers

On report of the nominating committee the nomination was presented of Dr. H. D. Spencer of Idaho Falls for President-elect. On motion nominations were declared closed and the secretary instructed to cast the unanimous ballot of the society for Dr. Spencer as president. In the same manner Dr. J. N. Davis of Kimberly was elected Secretary-Treasurer.

Councilor West District: Dr. J. L. Stewart of Boise being the only nominee was declared elected.

A. M. A. alternate: Dr. H. W. Howard was elected to fill the vacancy caused by the election of any eligible member in 1927.

Scientific committee: A. M. Newton of Pocatello, D. L. Alexander of Twin Falls were unanimously elected.

Committee of Public Health and Legislation: Moved by Dr. Roberts, seconded by Dr. Alexander, that the 1927 committee be reelected. Carried. The chair declared these reelected: Drs. J. L. Stewart of Boise, H. D. Spencer of Idaho Falls, J. N. Alley of Lewiston.

Reelection of the trustees of the Northwest Medicine: J. T. Wood of Coeur d'Alene, J. L. Stewart of Boise, C. M. Cline of Idaho Falls.

Associate Editors: Chas. Wetherbee of Twin Falls, N. R. Wallentine of San Point.

1929 Meeting Place

An invitation was extended by Dr. J. N. Alley to hold the 1929 meeting in Lewiston, this to be withdrawn if the Nez Perce Medical Society does not approve. Moved by Dr. Pond, seconded by Dr. Leete that this invitation be accepted. Carried.

On motion duly made by Dr. Alexander, seconded by Dr. Pond, it was voted to repeat a tri-state meeting in 1933 and that the date of such meeting be determined by the tri-state committee.

A bill was presented for $58.58 as Idaho's share of the meeting expenses of this date. On motion this was ordered paid and a vote of thanks extended to the tri-state committee.

Final reading of proposed amendment No. 4.

Amendment No. 4

That Article XI, as amended by Amendment No. 2, be amended to read as follows:

"Article XI"

Funds and Expenses

Funds shall be raised by an equal per capita assessment on each component society. The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of sixty ($60.00) dollars per capita per annum except on a four-fifths vote of the Delegates present.

On vote there were fifteen "ayes" and three "no's," Howard, Leete and Davis voting "no." The amendment was declared made.

Final reading of amendment No. 5.

Amendment No. 5

That Article XIV of the Constitution be amended to read as follows:

"Article XIV"

Amendments

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the Delegates at any Annual Session, provided that a copy of such proposed amendment shall have been forwarded to the secretary of each component society at least fifteen days prior to the opening meeting of the annual session of the state association, and that said proposed amendment shall have been read before the House of Delegates at least twenty-four hours prior to voting thereon.

On vote there were fifteen "No's" and three "ayes." The amendment was declared lost.

Resolution No. 1

WHEREAS, the resolution committee of the Idaho State Medical Association in Annual Session at the Canyon Hotel at Yellowstone National Park, August 27, 1928, has sensed the views of the majority of the members of the Society throughout the State, who feel that the dues and cost of maintainance are excessive and the overhead should be reduced so that the dues can be lowered, therefore be it

RESOLVED, that the dues be reduced to forty ($40.00) dollars and if consistent that an endeavor be made to further reduce the dues at the Annual Meeting.

Resolution No. 2

WHEREAS, no legislative action has been asked on the Basic Science Law and Medical Practice Act, due to the fact that the Legislature does not convene until 1929, we do further recommend this matter be brought before the Legislature of the coming session.

Moved by Dr. Gibson, chairman, seconded by Dr. Kellogg, that the report of the resolution committee be accepted and that the resolutions be adopted. Carried.

Moved by Dr. Alley, seconded by Dr. Alexander, that any physician who has been a member of good repute for ten years and is sixty-five years of age shall be extended privilege of honorary membership and all dues remitted. Carried unanimously.

Adjourned to meet upon the call of the chair.

Third Session

August 29, 11 a.m.

Members present: Proctor, Barclay, Gibson, Belknap, Kellogg, Cornwall, Spencer, Soderquist, Alley, Davis.

The council reported their audit of the books of the secretary-treasurer and that they had found them satisfactory and had ordered a general audit by a licensed accountant December 31, 1928.

Moved by Dr. Alley, seconded by Dr. Proctor that the report of the council be accepted. Carried.

The secretary reports the organization of the Woman's Auxiliary of the Idaho State Medical Association with the following officers:

President, Mrs. Alexander Barclay, Coeur d'Alene.
Vice-President, Mrs. H. P. Ross, Nampa.
Treasurer, Mrs. D. L. Alexander, Twin Falls.
Recording Secretary, Mrs. J. N. Davis, Kimberly.
Corresponding Secretary, Mrs. D. E. Cornwall, St. Maries.

Adjourned.

J. N. Davis,
Secretary-Treasurer.

POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., W. W. Allen; Secty., W. W. Baum

Polk-Yamhill-Marion Medical Society held its regular meeting Tuesday evening Sept. 4, at the Gray Belle, Salem. Dinner was served at 7 p.m.

The program for the meeting was arranged by the women members of the society: Drs. Mary Rowlan,, Mary Purvine, Estella Ford Warner, who were also hostesses at the dinner.

PROGRAM

"Some Phases of Infant Feeding," by Dr. S. G. Henricke of Portland.

Symposium on Malta Fever.

"Clinical Aspects of Malta Fever," by Dr. Grover C. Bellinger, Oregon Tuberculosis Hospital.

"Bacteriologic Diagnosis," by Dr. William Levin, Oregon State Board of Health.

"Septic Abortion in Cattle," by Dr. C. R. Donham, Oregon State College.

SOUTHERN OREGON MEDICAL SOCIETY

Pres., E. J. Wainscott; Secty., C. J. Moser

Southern Oregon Medical Society held its first autumn meeting Sept. 5, at the home of Dr. E. A. Woods at Ashland.

Mr. William M. Briggs, Medford attorney, addressed the society on certain phases of legal medicine.

Dr. W. L. Heitmeyer of the Southern Oregon Clinic, read a paper on "Intraperitoneal Medication." Dr. R. R. Johnson presented a dentist's conception of trench mouth.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., P. J. Gallagher; Secty., R. M. Schulte

Spokane County Medical Society held its first regular meeting of the season at Spokane, Sept. 13.

Dr. Chas. Mowery reported for the delegates to the State Convention.

Dr. A. N. Codd read a paper on "Bronchoscopy," showing slides in connection therewith.

Dr. E. L. Kimball, age 77 years, reviewed his fifty-three years of practice in medicine. This interesting talk portrayed the early studies under a preceptor, when his surgical equipment consisted of one long bladed bistoury and one mouse-toothed forceps.

Dr. J. M. Nelson was elected to membership in the society.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

THE TREATMENT OF DIABETES MELLITUS. By Elliott P. Joslin, M.D. (Harvard), M.A. (Yale), Clinical Professor of Medicine, Harvard Medical School, etc. Fourth Edition, Enlarged, Revised and Rewritten. 998 pp. $9.00. Lea & Febiger, Philadelphia, 1928.

The author of this book is fond at times of drawing upon his fund of scriptural knowledge to illustrate more vividly some salient point. If one were to imitate him in this respect and describe his recent effort in this way, the old parable of "new wine in the old bottles" would be most appropriate. The 1923 issue of this work was bound with the mortality statistics from which even this conscientious and tireless worker could not rid himself, but in this issue all is changed. In it one feels the spirit of the crusader. There is a new armor and a new sword, and into the old struggle the seasoned warrior steps with his new equipment. In this issue one finds portrayed the details of one of the most successful periods of struggle against disease known to medicine. We have passed from the Allen to the Banting era in the treatment of diabetes. This book is a finished text, the world's best volume on diabetes mellitus. It requires study to assimilate its details, but the effort put forth is followed by material reward. The first chapter on the diabetes of today presents the tremendous changes having occurred in the termination of cases of diabetes, showing how the factor of arteriosclerosis through prolongation of life is now becoming a serious complication. One also sees spectacularly portrayed the recovery of the depancreatized dog from coma.

The use of insulin is carefully outlined. In the second chapter on theory, incidence, etiology and curability, one receives hope and courage to meet the problems of diabetes in children, when he sees the statistics for the prolongation of life in such instances, and reads of the hope for the development of increased quantities of pancreatic tissue. The chapter on physiology and pathology is both extensive and comprehensive. It serves to illustrate how normal standards of metabolism are deranged in this particular disease entity. There is in this chapter a splendid illustration of what exists throughout the entire work, a most abundant and suggestive bibliography.

The presentation of laboratory procedures contains several new and time saving modifications of old methods. The closing chapters on treatment are full of the specific details for which the author is noted. Certainly all phases of the diabetic problem are discussed in a most meticulous manner. Promise yourself that you will get this work and, further, that you will take sufficient time to study it. There is more than fact; there is new life in it.

HOFRICHTER.

TEXTBOOK ON DISEASES OF THE SKIN AND SYPHILIS. Designed for the use of Students and Practitioners. By Albert Strickler, M.D., Professor of Dermatology and Syphilology, Temple University, Department of Medicine, Philadelphia, etc. With 218 illustrations including six full page plates, some in colors. 699 pp. $8.00. F. A. Davis Company, Philadelphia, 1928.

In this new textbook on dermatology the author has presented the subject in a form which should appeal to the student and practitioner. He has introduced numerous tables on differential diagnosis for the various conditions discussed in the text. These tables present the outstanding differential points of the disease in question in a concise manner. In presenting formulae for local use the author has indicated the action of the various ingredients in each compound. This is of considerable importance and value to the novice in dermatology for an understanding of the various drugs employed. It is to be regretted, however, that the author has relied solely on the use of the apothecaries system of weights and measures and omitted the metric system in these formulae. The text is very well illustrated by photographs taken largely from the author's collection which are of distinct value in a textbook of this character, not only to the general practitioner but also to the dermatologist.

ODLAND.

A PRACTICAL MEDICAL DICTIONARY. By Thomas Lathrop Stedman, A.M., M.D. Editor of the Twentieth Century Practice of Medicine, etc. Tenth Edition, Illustrated. 1194 pp. $7.50. William Wood and Company, New York, 1928.

Every practicing physician should possess an up-to-date medical dictionary. None is published superior to this volume. As an indication of the rapid multiplicity of medical terms, it is noted that this edition contains nearly five hundred words in addition to the contents of the previous edition of two years ago. There is little increase of the bulk of this volume by reason of omitting many obsolete terms, trade names, etc., which are of little importance. The text is amplified by instructive illustrations that help to clarify certain definitions. In addition to the complete dictionary of medical terms is an appendix containing much valuable information. A new feature is the section on pathogenic microparasites in condensed form, which presents the laboratory features of the most common bacteria encountered in practice. Any physician desiring the latest dictionary will not go amiss by the purchase of this volume.

THE EYE. By C. W. Rutherford, M.D., F.A.C.S. Associate in Ophthalmology, Indiana University School of Medicine, etc. With 305 black and white figures and 12 original colored plates. 404 pp. $7.50. D. Appleton and Company, New York and London. 1928.

A product of Appleton's, which means class in press art and, written in a style assertive but not dogmatic, this volume at once commands respectful notice. Through personal experience the author knows the need of knowledge of the essentials of ophthalmology in general diagnosis. Consideration

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for the requirements of the general practitioner is seen in his free reference to ocular evidence of remote disease and to the relations between the specialty and general medicine. The excellent elucidation of these relations can be read with interest by the specialist too and with perhaps no less profit. Personal experience gained later in teaching comes to his aid in presenting facts in a form assimilable by students. No pen could be so skillfully guided in this respect except in the hand of a successful instructor.

The essentials of the anatomy are given in an introduction to each section. The relative practical importance of the many diseases and conditions of the eye has been determined with excellent discrimination and with due regard for economy of space and of the reader's time. Succinct as a whole, there is no false economy where elaboration is needed. The author's unusual clarity in description calls forth visualization to a high degree, thus making study less arduous and undoubtedly deepening impress on memory.

There is a chapter on evaluation of disabilities from industrial eye accidents. This comprises the Report of the Committee of the Ophthamological Section of the A.M.A. in 1925 after six years' investigations, together with their supplementary report in 1927. Eight well selected tests for detection of simulation are given in the concluding two pages. The book is loaded with good points and helpful hints. SEELYE.

PREVENTIVE MEDICINE. By Mark F. Boyd, M.D., C.P.H., Member of Regular Field Staff, International Health Division of Rockefeller Foundation; formerly Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas. Third Edition, Revised. Octavo volume of 745 pages with 151 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $4.50 net.

This is an excellent treatise on preventive medicine. It is evidently written not for the health officer or would-be sanitarian, but for medical students and general practitioners. Its most noticeable characteristic is the great condensation of this very large subject so that we find all through the work the subject matter divided into paragraphs 1, 2, 3, or (a), (b), (c), etc., in order to summarize succinctly all our knowledge on the subject. Thus a vast amount of knowledge is presented in a comparatively moderately sized volume. Besides considering the diseases caused by contact and by insects, there are chapters on disinfectants, excreta disposal, water, milk and other foods as sources of infection, deficiency diseases, occupational diseases, the puerperal state, heredity and disease. Also there are to be found chapters on hygiene of infancy and childhood, on air, heating and ventilation and certain aspects of personal hygiene. The work closes with chapters on statistics of population, of births and deaths and of sickness, with a final chapter on public health administration. There is no other work which presents in so concise a manner all the essential facts on preventive medicine. WINSLOW.

THE SURGICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume 8, number 4. (Philadelphia Number, August 1928) 285 pages with 91 illustrations. Per Clinic year (February 1928 to December 1928.) Paper $12.00; Cloth, $16.00. Philadelphia and London. W. B. Saunders Company, 1928.

This volume contains clinical reports on a great variety of surgical topics. DaCosta presents a case of cancer of the rectum with a discussion of all phases of this condition. He says it is desirable, whenever possible, to perform radical extirpation by the method of Coffey. The subject of cancer is also discussed in connection with clinical reports by other authorities. Gallbladder disease in its various aspects is considered in a number of clinical reports. This volume, as is true of all of these clinics, is replete with much valuable information.

THE NEW POCKET FORMULARY. By William Edward Fitch, M.D., Formerly Lecturer on Surgery, Fordham University, etc. Fifth Edition Revised and Enlarged. 50 pp. $3.00. F. A. Davis Company, Philadelphia, 1928.

This handy volume contains much information of use to the average practitioner. Useful prescriptions appear for commonly encountered diseases, arranged alphabetically. A table of differential diagnoses offers readily available suggestions. Recognizing the importance of diet in treatment of diseases, a section contains suggested diets for commonly encountered diseases. One will find much other valuable information in this little book.

RECENT ADVANCES IN CHEMISTRY IN RELATION TO MEDICAL PRACTICE. By W. McKim Marriott, B.S., M.D., Dean and Professor of Pediatrics, Washington University School of Medicine, etc. Illustrated. 141 pp. $2.50. The C. V. Mosby Company, St. Louis, 1928.

This volume comprises lectures delivered before the San Diego Academy of Medicine in 1927. The average physician does not keep abreast of the rapid changes in chemistry as applied to the practice of medicine, although a knowledge of such is useful to modern practice. In this volume the author summarizes existing knowledge, presenting the facts in simple, comprehensive terms. There is a brief discussion of fundamental principles dealing with atoms, ions, colloids and the like. The consideration of acidosis and alkalosis is a practical presentation of these conditions, with a discussion of the diseases with which they are associated. The chapter on chemistry of the blood briefly presents the facts in this form of study. Chapters on foods and metabolism and the endocrines offer many useful suggestions.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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Vol. XXVII. NOVEMBER, 1928 No. 11

ADDRESS

QUESTIONS BEFORE THE OREGON PROFESSION *

Hugh S. Mount, M.D.
OREGON CITY, ORE.

It is a source of great pleasure and satisfaction to me to have had the honor and pleasure of serving you since 1918, as vice-president, councilman and the last year as president.

Up to this time I have not quite understood just why all this honor should be thrust upon me by the Society, when there are so many men more capable and better qualified to serve you. The only reasons I can account for all this are, first, my regular attendance at meetings, and, second, being in close proximity to Portland, it was my duty to look after the outside districts.

Soon after I was graduated in medicine, I felt it a privilege and a duty to join a medical society, so as to continue my education, not only for my own benefit but for that of my patients. Whatever success I have attained I attribute wholly to my membership in these medical societies and with the splendid association with their members, where the best men in the state assemble for discussion of different subjects. I feel sorry for the man who never joined a medical society or, if he did, never attended the meetings to receive the benefits that accrue from such association in the component or the state society, or some of the many other societies of today in the specialties. Our by-laws, by the amendments of the last few years, have taken a step forward in creating a junior membership for a period of three years, so in that time the younger men may realize the advantages to be gained by such membership.

My only regret is that I have not been able to accomplish more in the short space of a year, as president. There were so many things needing attention that it was almost impossible to get to them all, as you realize the councilmen and committeemen are all busy men. Splendid workers, fine fellows, no one could ask for a better body of men to work with, and to ask them to do more would be an imposition. Here is where our executive secretary has been of great benefit to the Society. His work is piling up and in my opinion the time is not far distant when he will need additional help. The constitution and by-laws provide for the continuance of this work, which is a splendid thing and a step in the right direction.

You will remember in 1921, when the council convened for its session, following the state meeting, there were outstanding in bills $500.00, with little or no money in the treasury. The bills had to be paid, the credit and honor of the Society were at stake. Many of the men who had carried the load in the past had gone to their last resting place. The Council realized that it would be an imposition to solicit funds to meet these obligations which

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* President's address, read before the Fifty-fourth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 20-22, 1928.

belonged to the membership of the Society as a whole, and not to any individual or set of men. In the meantime, it was necessary to borrow the money to meet these obligations. It was Dr. Walter T. Williamson who lent us the money to meet them. Following this came the resolution of Dr. Chas. J. Smith, raising the dues of the Society so that it could meet its obligations. That was the beginning of laying of a firm foundation for a greater and better state Society.

In 1923 when the dues were raised, we left the horse and buggy days for the automobile and aviation. By that I mean the Society has been going forward, until today it has taken its place among the highly respected and worthwhile organizations within the state, so much so that the press calls upon us for information, refers correspondence and the like to us, and seeks our counsel. For the first time in history this has been accomplished in our state. Our Executive Secretary is invited to join other organizations, because they realize we are a scientific, educational and business organization, properly financed and able to take care of ourselves under any and all circumstances. They also realize there is no other body of men and women that has the welfare of the public at heart as the scientific and business organization of the Medical Society has, that we can call some twenty-five thousand comrades to our rescue if need be.

INSURANCE

During the past year the doctors of Lane County had their insurance policies canceled by the General Accident Company and the Aetna Insurance Co., which carried their liability insurance. The excuse given by these insurance companies was that the doctors were not working in harmony, that they were fighting one another, and several suits were caused by this dissatisfaction among them, yet only one out of three suits went against the doctors and that is now before the Supreme Court. Mr. Foley, executive secretary, and I went to Eugene and investigated these cases. In our opinion, this was a move on the part of the insurance company to raise its premiums throughout the state and they used these suits as an excuse. We were able to get insurance for the doctors in another company which was satisfactory.

The Committee on Medical Defense has done some wonderful work this year. They have not lost a suit. There have been two reversals in our favor in the Supreme Court. In one case the cards were stacked against our member who was being sued. The arrival on the scene of the Defense Council, with two specialists in their respective lines, created considerable confusion among witnesses. A nonsuit followed.

STATE MEDICINE

I have not forgotten the government ownership of railroads, when you asked for accommodation and you took what they gave you. Now you get what you pay for from the railroad. I am opposed to the government ownership of electric power. I am opposed to free medicine and free legal opinion. It is best to pay for what you get, and get what you pay for. Our State Industrial Accident Commission is near enough state medicine. The committee on the cost of medical care, of which Ray Lyman Wilber, M.D., is chairman, has a five-year program. They must be watched.

GRANGE

The grange is making some complaint that the young graduates are not going to the country to begin their practice, that in ten years more there will not be any doctors in the country as that will be the end of their expectancy. I wonder if they would like to go back to the horse and buggy days, the muddy roads, etc. Today one can get to his patients in one-third of the time he could twenty years ago. With hospital accommodations and ambulances at their command I can see no reason for complaint.

CLINICS

Along this line the committee must become very active, to see that those who are deserving receive proper care, and those who are able to pay must return to their own physicians.

INDUSTRIAL WORK

In the industrial world, to my mind the greatest accomplishment has been in bringing the men engaged in each industry closer together, and in teaching them they can cooperate with each other and still do more business all around with a happy and congenial association. Whenever the members of the medical profession grasp that understanding, we too will be happy and congenial, and will be doing all the work one can do, and doing good work. Then the State Society will have reached its perfection.

In the last few years I have been trying to get the profession interested in this work to the extent of asking for a change of the Commission, as there are only three parties interested in the conduct and work of the Industrial Accident Commission. Those are industry, labor and the medical profession. Then why should the profession not have a representative on the Board, or a full-time medical man in an advisory capacity.

Along this line there is published a report by the National Industrial Conference Board as suggestions, which represents the best judgment of medical and lay persons with extensive practical experience in the administration and operation of legislation. It is hoped that these proposals may stimulate closer attention to the question of medical standards, and contribute to the adoption of such medical provision as may best promote the operation of workmen's compensation laws in the interest of employees, employers and the public.

The lack of adequate medical representation on the staffs of compensation commissions has been noted. As medical questions are involved in most cases coming before the commission for adjustment, it is felt there should be attached to each commission a physician whose duties would be in part (1) to advise members of the commission on medical questions arising in their work, (2) to examine fee bills and recommend settlements of those in dispute, (3) to supervise and supplement the work of the examining physicians of the commission, (4) to put into effect recommendations of the consulting staff hereinafter suggested, and (5) to acquaint physicians with new developments and trends in the treatment of industrial cases.

The medical director's appointment should be based on his qualifications for the position and should be without reference to political affiliation. While his appointment would come from the legally authorized appointing agency in the state, it would, if made on the recommendation of the State Medical Society, tend toward the selection of a better qualified physician than if made without the necessity of such recommendation.

The consulting staff, appointed after recommendation by the State Medical Society, should be composed of recognized specialists in the branches of medical practice most concerned with industrial injuries and diseases. The recommendation of the Society as a prerequisite to appointment would, as in the case of a medical director, reduce the possibilities of political influence to a minimum and would give assurance that only properly qualified men would be considered.

The consulting staff should always be available to the commission and medical director for consultation and advice. With the medical director it should advise concerning the principles that underlie the administration of the medical provisions of the law, such as reasonableness of fees, quality of service demanded of physicians treating compensation cases, and qualifications of examining physicians. The staff should make available to the commission its collective experience in the treatment and handling of cases which are or may be compensable and should consider any other matters that would properly come before it. The members of the staff should be remunerated for the actual time spent in compensation work and for the necessary expenses of their work.

The highest available type of physician in different industrial communities should be selected for this work. Their duties would be to make examinations of the injured workers in cases of dispute or where the administrative authorities desire further information regarding the condition of the claimant. They would determine the extent and probable duration of disability and the extent of permanent impairment, if any. They would give testimony at hearings, subject to restrictions noted in the section on Reports and Testimony of Physicians.

These men should be selected by the consulting staff solely for their professional ability and without reference to political affiliations and should be paid adequate fees rather than a salary. They should be preferably in active practice and should be encouraged to keep themselves fully informed regarding the treatments and handling of compensation cases. Their work should be subject to review by the medical director and the consulting staff, to whom they should refer cases presenting unusual or difficult problems.

As noted earlier in this report, the qualifications of physicians are very loosely set forth in all the compensation laws. No educational attainments or experience is required other than that the physician must be licensed to practice and be competent. The treatment of injuries encountered in compensation work is being recognized as of increasing importance and as demanding the highest type of professional skill. It has been determined beyond question that in many cases the length of disability is related directly to the adequacy of medical treatment, and that when prolonged by inefficient or unscientific methods of treatment the compensation costs are greatly augmented.

Although the treatment of industrial injuries by nonmedical cults, while recognized in a few states, has in general been condemned by workmen's compensation commissions, their insistent efforts for legal authority to practice their teachings have nevertheless introduced a problem of no mean proportions into compensation work. It is only just to the injured worker, the employer, and the community that a high type of regular medical service should be maintained.

Official fee schedules have now been adopted in fourteen states. This policy is one of slow growth, and its introduction doubtless depends largely on the influence of the organized profession in each state. Capable physicians cannot be expected to sell their services to compensation work for a smaller fee than they command in their private practice. "The increased security of payment" noted in the Texas law might justify a slight reduction in fee schedules for compensation cases, but this reduction should not be sufficient to destroy the interest of capable physicians and to attract only those of mediocre ability or worse. If these principles are adhered to, few cases of disputed fees will arise in compensation work, and where such do arise the commission should be empowered to render final decision.

The attending physician in a compensation case should be permitted to order and obtain all necessary treatment for cases under his supervision. This is particularly true as regards nurses and hospital service. While it is recognized that unnecessary methods of treatment may be resorted to and unwarranted expense incurred in some cases, it is felt that the attending physician should be permitted a greater latitude in these matters than he now is in some states. With the knowledge that this treatment may at any time be investigated by the medical director or consulting staff, any tendency to extravagance would be strongly curbed.

The examination of injured workers, both immediately following an accident and subsequently is of importance and often furnishes the only means by which adequate information of the worker's true condition and the extent of his defect can be obtained. It is felt that the workers should not be called on to bear the entire expense of subsequent examinations that are demanded by the employer, but that such expense should be charged against the party requesting the examination. This provision will tend to prevent unnecessary requests for examination. The necessity for obtaining authority for subsequent examination from the commission or its consulting staff will also tend to reduce such examinations to a minimum.

Experience has shown that, when the choice of physician is left entirely to the injured workers, the ones they select are often not so fully equipped to handle the case as are those selected by the employer. When the choice rests with the worker, he may call any practicing physician in the community, regardless of his experience in such cases. On the other hand, when the choice rests with the employer he will refer all his cases to one or at most a few physicians who with such experience become better able to give adequate treatment to industrial cases. They come to understand the workers and to know their places of employment and the type of occupation and manufacturing processes in which they are engaged. Moreover, the employer has a direct interest to furnish the best medical and surgical service, since the amount of his liability will depend upon the results of treatment. For these reasons it would seem best that the choice of physician rests with the employer. In order that treatment may not be interrupted and the employee subjected to unfavorable conditions, requests by employes for a change of physician should be granted only on proper showing to the commission.

In those rare cases where the employer through emergency fails to provide the necessary treatment and the employee secures it through his own effort, the employer should not be permitted to force a change of physician to one of his own choosing, if proper treatment is being given. In such cases, as well as in ordinary cases of medical attention for injured workers, the knowledge of supervision will tend to secure a more able treatment of the case than might otherwise be given.

With the consulting staff functioning properly in the duties outlined above, one of which was to furnish expert testimony at hearings and in disputed cases, it should be unnecessary to employ so-called experts to testify at hearings. Frequently they do not see the patient until they appear at the hearing and have had no previous opportunity to examine or study the case. When two or more such witnesses appear at a hearing their testimony is likely to be conflicting and to cause confusion in the minds of the commissioners, making it more difficult for them to render an impartial decision. Testimony of such experts is likely to be more academic than relevant to the case at point, and commissions may make, and doubtless frequently have made decisions on the basis of such theoretical testimony rather than on the testimony of physicians who have had extensive practice in the treatment of similar cases.

In order to be eminently fair and impartial the reports of physicians who examine patients and give testimony at hearings should acquaint all interested parties with the facts which such reports or testimony are expected to prove. Different interpretations may be placed on these facts by different witnesses, but if interested parties are made familiar with them previous to hearings much loss of time and much controversy could be avoided.

Confusion and delay could also be obviated if the findings of physical examinations by the examining physician appointed by the commission were furnished at once to all interested parties or their representatives. This would eliminate one cause for delay in the settlement of cases which leads to criticisms of the administration of these laws.

If the suggestions made on choice of physician are carried out, the employer will be responsible both for furnishing needed attention to his injured workers and also for its quality. If an employee refuses further treatment by the attending physician or engages another physician to treat him, the employer should be released from further responsibility in the matter. He should also be entitled to know the actual condition of the worker at the time this refusal of further service or change of physician takes place. A copy of these findings should be filed with the commission for future consideration of the employee's claim. In this way the employer could not be held responsible for the results of lack of treatment or of malpractice on the part of the physician engaged by the employee. This places the compensation work upon the shoulders of the State Medical Society. It would seem to me to be almost an ideal system for caring for the injured workman. Not only for industry, labor, and the medical profession, but hospitals and dentists could be taken care of as well. This, too, is a step away from state medicine.

In conclusion, I wish to express the appreciation of the State Society to the Trustee of the American Medical Association, Dr. Joseph A. Pettit, our delegate to the Association, Dr. Wm. Kuykendall, and to doctors who went to Minneapolis and assisted in bringing the American Medical Association to Portland for their next annual meeting.

It will be twenty-four years since they last met in our state. I hope every doctor in the state will attend this meeting, and you will consider it your duty to assist in every possible way to entertain the visiting medical men and their families, because they will be your guests and mine. In this way you will reap the greatest benefit by their having come to Portland. They will go away with a kindly feeling toward us.

To the President-elect, and to the other officers and committees, who will take over the duties of their offices tomorrow, you have my very best wishes. I again thank you for the honor you have bestowed upon me.

ORIGINAL CONTRIBUTIONS

PERSONAL EXPERIENCES IN ABDOMINAL SURGICAL EMERGENCIES *

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Many are inclined to think only of traumatic lesions when the subject surgical emergencies is mentioned. It is proposed here to discuss abdominal emergencies under four headings: (1) Spontaneous, (2) traumatic, (3) operative, (4) postoperative.

In class 1, the so-called spontaneous surgical emergencies, we will briefly discuss acute appendicitis, perforating gastric and duodenal ulcers, gastric hemorrhage, due to intrinsic and extrinsic causes, hemorrhage whether subcutaneous or from one of the mucous membranes, particularly those associated with splenomegaly, and acute gangrenous cholecystitis.

In class 2 will be considered traumatic rupture of solid viscera, particularly the spleen, and hemorrhage.

In class 3 are operative emergencies, or such conditions arising from unintentional injury to the common duct during a cholecystectomy, injury of the intestines during an abdominal incision, hemorrhage during abdominal operations and sliding hernias.

In class 4 are found postoperative intestinal obstruction, alkalosis, postoperative hemorrhage and postoperative rupture of the abdominal wall.

This paper was prompted by some of the following experiences:

A young physician was lamenting the fact that a patient could not be operated on by the house officer and said, "If I had a pain in my belly I would want the first surgeon around to operate on me." An older surgeon replied, "I would rather wait a little until an experienced man could arrive. His judgment would in most instances justify the delay."

Another inexperienced doctor operating on a patient found a perforating gastric ulcer. The doctor removed the appendix, put in a drain and remarked, "If I knew how to do one of those things," meaning a gastroenterostomy, "I would do it." It should be remarked, parenthetically, that this patient recovered.

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* Read before the Seventh Annual Meeting of Pacific Northwest Medical Association, Tacoma, Wash., July 5-7, 1928.

A great surgeon, speaking to a hopeful young man, said, "It is fortunate that you have not a large surgical practice yet because you could not handle it." Little did the young man realize the truth implied, "What would you do with it?" That is precisely the question under discussion, What would you do with it? All abdominal emergencies call for experience, knowledge of literature, conviction and prompt action. When one considers the subject of abdominal surgical emergencies, it is necessary to mention, first, that subject about which most has been written, appendicitis. Zachary Cope has only recently said, "If the mortality from appendicitis is to be reduced almost to the vanishing point, it is essential that the early signs and symptoms of the condition should be appreciated."

It is interesting to contrast that statement with the expression of Murat Willis (1926): "The mortality from appendicitis has increased 31 per cent during a period from 1905 to 1922. In 1921 it was 14.4 per 100,000 population. There are about 16,000 deaths annually in the United States from appendicitis. The annual toll taken by appendicitis almost equals the combined total of intestinal obstruction, gallstones, and gastric and duodenal ulcers. Before the age of forty-five more persons die annually from appendicitis than cancer."

The contrast between the Utopian idea of Cope and the statistical findings of Willis must make one realize that the ideal status of knowledge and skill has not been reached. Probably one reason is that given by Hendon in the following quotation: "The only hand that paints a perfect picture of pathology is the hand of death, and the only critic that applauds the pathologic art is the grave."

One reason why so many are lost is that some wait for the perfect picture. Some depend too largely on the blood count. It cannot be emphasized too much that delay may mean death. The complete clinical picture is not necessary. Proper interpretation of signs and symptoms will lead to better results.

We believe that too much stress is placed on operation and not enough on diagnosis. There are many skillful operators who are not equally skilled in diagnosis. One way to reduce mortality is to make early accurate diagnosis and operate at once. To compromise or delay because of family prejudice to operation may mean your reputation and the patient's death.

One cannot expect each case to present the classic picture. Some of the worst cases are those where the patient walks into the office. It may not be difficult for the surgeon to diagnose the condition, but the fact that the patient has a sense of well being and has considered his illness a trivial matter makes it difficult to convince him of the urgency of an operative procedure.

Such cases may be illustrated by the following experiences:

Case 1. Mr. L. L. (1914) walked into the office and gave the history that he had had abdominal pain for about forty-eight hours. During the past few hours his pain had been relieved.

Examination revealed marked rigidity on the right side and a large mass. Palpation did not cause the patient pain.

Immediate operation revealed a ruptured gangrenous appendix from which the patient eventually succumbed.

Case 2. Mr. J. L., age 40 (1927), complained of epigastric distress, as the patient described it, "same feeling as it is when stomach is out of order." During the preceding day he had taken a purgative, since which time his pain increased. No nausea nor vomiting had been associated with his pain. His bowels had acted. Temperature, 99°.

Abdominal examination revealed no tenderness above the umbilicus; slight defensive attitude of the muscles on the right side below the umbilicus. The leucocyte count was 13,750 with a differential count of 68 per cent neutrophiles, 27 per cent large mononucleated and 5 per cent small mononucleated.

This patient was advised that he had acute appendicitis and he should be operated upon. He demurred, in fact, stated that he was not sick enough to be operated upon. After forty-eight hours he consented to go to the hospital.

At operation we found a gangrenous appendix. The convalescence was stormy as it was accompanied by a severe bronchopneumonia.

Case 3. Mr. G. L. (1927) walked into office complaining of pain which had persisted twenty-four hours. His bowels had acted. He had been able to work and at no time had his appetite been impaired. On physical examination there was pain on pressure on the right side of the abdomen, slight resistance of the right rectus muscle and slight elevation of temperature.

He was operated on in the afternoon of the same day and a gangrenous appendix was found. Recovery was uneventful.

Case 4. Miss M. S. (1921) complained of pain for four days, nausea but no vomiting. Temperature 99°, pulse 90. Leucocyte count, 12,000, 83 per cent neutrophiles. Patient refused immediate operation. Against advice she went to hospital in an automobile.

At operation, which was performed immediately after admission, we found a gangrenous appendix and a large quantity of cloudy fluid in the abdominal cavity. Her convalescence was uneventful.

Case 5. Mrs. B. P. (1927) was examined because of an epigastric pain, for which she had been under treatment by another physician for several months. Heaviness after eating, not associated with eructations. Temperature 99⅗°. Leucocyte count 10,000, 80 per cent neutrophiles.

Abdominal examination revealed right rectus rigidity. Hyperesthesia right side below umbilicus, and pressure over the umbilicus was accompanied by pain in right lower quadrant of abdomen.

Operation in this case was not considered urgent. She was operated on the following morning. At this time we found a large quantity of free peritoneal fluid. The appendix was thick and its vessels were markedly injected.

The fact that a patient is examined in the office, and even feels well enough to attend to his work should not deter the surgeon from feeling, if the clinical manifestations justify it, that an actual emergency exists. He should have the possible danger which he is facing clearly outlined to him, thus placing the entire responsibility on him.

Frequently the history may be misleading. Particularly is that true in cases where the patient insists that he has committed a dietary indiscretion. Diarrhea associated with abdominal pain does not necessarily mean that appendicitis is not the cause. This can be illustrated by the following case:

Case 6. Mr. T. B. (1927) complained of pain in the abdomen for about twenty-four hours. During the preceding night he had drunk a large quantity of home-made wine. His pain was not constant and he had had frequent stools. His temperature when first seen was normal, pulse 78. Two hours later the temperature was 100°, pulse 90.

The doctor who first saw him did not consider it of sufficient importance to make a blood count. The patient was seen two hours later by the author. The leucocyte count was 18,200, 78 per cent neutrophiles. There was some tenderness in the lower quadrant.

At operation five hours later we found an appendix covered by a fibrinous exudate. The lumen was constricted about one inch from the tip.

When the diagnosis is questionable, delay for a few hours during which time the patient can be kept under observation and repeated blood counts made is justifiable.

Case 7. Mr. S. L., age 18 years (1926). I was called to see him the night of September 27, 1926. He had had pain in the abdomen during the entire day; the pain was diffuse, later localizing in the upper segment of the abdomen. There was no urinary frequency. He vomited once about 7 p.m. His temperature was 97⅘°. He was apparently perfectly comfortable.

There was abdominal tenderness but no rigidity on either side of the abdomen. The only area where I found tenderness at all was the right hypochondrium. His pulse was 72. Leucocyte count 14,700 with 80 per cent neutrophiles. Prior to getting the report I advised the mother that I could not definitely make a diagnosis of appendicitis at that time, but in view of the fact that he had had previous similar attacks I felt we should make further observations, and if within twelve hours he still had pain, we would advise operation.

The following morning it was reported he had had a comfortable night, no nausea nor vomiting. The bowels had moved by enema, the temperature was normal and his pulse was 84. I found slight tenderness in the right iliac fossa.

I advised operation. We found an acute inflamed appendix which was stuffed and its walls were tense and friable. In places discoloration of the walls suggested beginning gangrene.

Relief from pain is sometimes taken by the patient to indicate that he is improving, whereas in reality this may be an indication of gangrene, therefore being evidence for an emergency operation.

Case 8. Mr. E. M., age 22 years (1927). History. Pain in the lower abdomen for twenty-four hours. He took a purgative, after which his pain was worse. When admitted to hospital he felt fine. The abdomen was rigid, particularly in the lower segment. The leucocyte count was 19,500, 87 per cent neutrophiles. At operation we found a gangrenous appendix.

Certain cases, particularly when viewed in the light of results, make one question whether operation should be performed in similar cases.

Case 9. Mrs. H. A. F., age 47 years (1923). Present illness began about four weeks before with attack of pain in the lower right abdomen. No nausea nor vomiting. Pain remained constant.

On examination there was a mass palpable in the lower right quadrant of the abdomen. Clinical diagnosis: acute appendicitis, probably with abscess.

At operation we found a large quantity of free peritoneal fluid. The appendix was closely adherent to the posterior cecal wall. After the appendix was removed, the cavity from which it had been taken was enlarged and a large quantity of thick purulent material evacuated.

Five days after operation the patient complained of great pain in the left leg and thigh. Examination revealed marked redness and swelling of the leg, evidence of a thrombophlebitis.

Three days later temperature rose to 104°. There were rales at the base of the right lung and the patient succumbed from pneumonia which, I believe, was due to a septic infarct.

Case 10. Mr. S., age 45 years (1924) History. Pain for about two days, during which period he was confined to bed. He was first seen on the day of the operation.

Examination revealed abdominal pain, tenderness, distention and rigidity. Leucocyte count 26,000, 72 per cent neutrophile.

Immediate operation was done, at which time a large quantity of free pus was found. A fibrinous exudate was seen on the coils of the small intestines. The appendix was seen in the fossa between the cecum and ilium and removed. Six days after the operation he developed an acute dilatation of the stomach, toxic nephritis, and death ensued.

In cases of this kind Wilkie's statement is particularly pertinent. "In late cases in reasonably good condition is one justified in interrupting the natural process of cure which by that time is well established? To operate on all cases at once is to allow reason to be overruled by prejudice."

Since some of these cases are in reality peritonitis, one might add, to what Wilkie has said, the notable comment of Armstrong. "The operating surgeon only needs courage, not the courage of heroic activities but courage to stay his hands."

It is easy enough to philosophize about these cases in the light of their end-results, but no hard and fast rule can be made and judgment alone in the individual cases must be our guide. If we knew beforehand much which we find out afterwards, it is easy to see how much better doctors we would be. Our best will be better, if we analyze our own results, and try to profit by the experience of others.

Enough has been said about the appendix. Most of us feel, I believe, that early diagnosis and early operation will avoid many of the sad sequences of delay.

Another type of acute abdominal condition is the acute gallbladder disease. The question as to whether these are emergencies or not is still being discussed and variously answered by some of the greatest masters dealing with the subject. This may be illustrated by quoting from a recent paper by Bruggeman, read before the Western Surgical Association, December, 1927.

"Acute cholecystitis may be compared to acute salphingitis in that it rarely kills if treated conservatively. Surgical writers are prone to compare it to acute appendicitis, but this comparison is not in consonance with the clinical facts. Acute cholecystitis does not cause widespread peritonitis unless a perforation occurs early.

"Operation is indicated in any case when the diagnosis is questionable, or if a perforation is suspected. The greatest danger in this conservative treatment is the possibility of a mistaken diagnosis.

"I feel that I have ample support in my position that operation is very seldom indicated. It is my conviction that as a rule operation should be avoided until the signs of active inflammation have disappeared."

Bruggeman quotes Walton, Leriche, Cotte, Kirschner and many other foreign surgeons who advocate cholecystectomy in acute cholecystitis; on the other hand, Haggard, Deaver, Bunts, Lyons, Judd, Richardson, Muller, Archibald and many other American surgeons are opposed to operation in the acute stages. Most American surgeons are of the opinion that only the urgent cases should be drained. We have not considered acute cholecystitis as a condition warranting emergency operation.

In those cases where an empyema of the gallbladder or gangrene is associated, drainage operations are done. The friability of the gallbladder, the possible difficulty incident to ligation under these conditions and the fact that the gallbladder is usually well walled off seems to justify this policy.

Case 11. Mr. C. L., age 24 years (1927). History. Two days ago he was seized with severe pain in the upper right abdomen. The pain had been constant and severe. There was a prodromal malaise for a few days before the attack. Nausea was noted.

Previous history. A year and one-half ago he had been jaundiced for several weeks. Preceding the jaundice he had had pain in the upper quadrant of the abdomen, but not nearly as severe. Again about three weeks ago he had pain, not very severe. During the attack his stools were pale, the urine was dark brown and the perspiration stained his garments.

Abdomen: Marked rigidity of the upper right quadrant with considerable pain and tenderness in this region. There was slight rigidity in the lower right quadrant and very slight tenderness. We were unable to palpate the liver and spleen. Leucocyte count 22,000, 87 per cent neutrophiles.

Operation: Right rectus incision, its middle corresponding to the umbilicus, so that we could enlarge above and below as the case may be. There were no flakes of fibrin on the cecum. The appendix was small, almost of the obliterative type. There was a band covered by a pericolic membrane. It was easily seen at a glance that the appendix was not responsible for any of the man's present trouble. The hand introduced into the upper abdomen revealed a gallbladder which was about five inches long and its greatest diameter about two and one-half inches. It was thick walled, tense and stood out against the surrounding collapsed organs as the evident cause of the disease.

The incision was prolonged upwards; the walls of the gallbladder were seen to be pale gray, very thick and friable. A cholecystostomy was done, and the abdomen closed. The appendix was not removed. He made an uneventful recovery. Three months later a cholecystectomy was performed and the patient is now relieved of all of his symptoms.

Case 12. Mrs. M. B. W. (1921). History. Pain in back for six days which increased in severity. The pain radiated to the right breast. In spite of her pain she continued to work. She had never had digestive disturbances of any kind.

Four days after onset the pain began to localize in the upper right quadrant of the abdomen. Two grains of codein failed to relieve her pain. The physician in attendance introduced 20 per cent magnesium sulphate through a Jutte tube for the purpose of draining duodenal contents and the gallbladder. She vomited the tube, after which the severity of the pain increased so that one-half grain of morphine had to be given.

I first saw her the following day, when her temperature was 102°, pulse 108. The leucocyte count at the time of admission to the hospital was 26,000.

Abdominal examination: Marked tenderness and pain in the upper right quadrant, localized over the gallbladder. The examination otherwise was unimportant. Diagnosis of acute cholecystitis with probable empyema of the gallbladder was made.

At operation we found a quantity of clear serous fluid. The small intestine was covered by a fibrinous exudate. The tip of the gallbladder was black. A rubber dam strip was applied over the gauze packs so that, if there was any spilling, we would limit it to a certain extent. The incision was made in the gallbladder and about six ounces of thick bile was aspirated. The walls of the gallbladder were possibly 1/16 of an inch thick and, when the finger was introduced into the abdominal wound, we were able to feel a large stone in the lower portion of the gallbladder, possibly obstructing the cystic duct. This was removed from the gallbladder, after which a Pezzar catheter was introduced into the opening. The appendix was seen to be small and gave no evidence of disease and for that reason no attempt was made to remove it, believing that the prolongation of the operation under these conditions might possibly be disastrous.

Summary: This operation was done seven years ago, since which time she has remained well.

Reference to the operative record shows that there was a fibrinous exudate over the entire small intestine, the fundus of the gallbladder was discolored, the walls were thick.

The pain which she experienced was evidently due to the blocking of the cystic duct by a large stone. A cholecystostomy was done. No effort was made to do a cholecystectomy as we believed that such an operation would probably have resulted fatally.

Jaundice is at times an indication for emergency procedure such as cholecystostomy in gallbladder disease.

Case 13. Mr. H. J. F., age 35 years (Nov. 1927). Two weeks ago patient became jaundiced. The stools were at times normal in color, at other times gray. No pain had been experienced in the abdomen at any time. He had been nauseated and at times complained of an epigastric fullness.

Examination revealed a deep jaundice. He was extremely toxic and weak. The abdomen was distended, but no marked tenderness except in the right hypochondrium. The patient looked like the obstructive type of jaundice, associated with malignancy.

The Van den Burgh direct showed strong reaction. Leucocyte count 9,000, 80 per cent neutrophiles. Bleeding time two minutes. The x-ray diagnosis was perforating duodenal ulcer.

He was seen by me first on November 23, 1927. Cholecystostomy was done November 25. This was performed because of the marked toxemia and in the hope that the biliary drainage might relieve the jaundice and the toxemia incident to it. The patient improved readily, his jaundice gradually cleared up, and three weeks after the operation he was allowed to go home.

Cholecystectomy was done February 25, 1928. At that time he was no longer jaundiced and the drainage from the gallbladder was a clear mucus. The stools had a normal color and therefore we felt cholecystectomy was justifiable.

At the second operation we found a great many adhesions and it was difficult to outline the muscle. After the peritoneum was opened we found the omentum adherent along the whole upper portion of the retracting peritoneal leaf. These dense adhesions were cut through after clamping and the omentum transfixed and dropped back. The gallbladder was adherent to the peritoneum by a large omental fold. This was cut through and transfixed. The gallbladder was large, thick walled. There were no stones palpable, but there was a gland just at the cystic duct which was probably three-quarters of an inch in length and half an inch in the transverse axis (the largest gland I have ever seen along the cystic duct).

There were apparently no stones in the common duct, which was patulous and soft. The head of the pancreas was not hard. There was no evidence of an ulcer of the stomach or duodenum. The adhesions between the gallbladder and the omentum had produced a constriction over the duodenum and this in turn had caused a dilatation of the first portion of the duodenum. As soon as these adhesions had been cut through, the duodenum filled out below. The gallbladder was removed then in retrograde fashion and the fossa peritonealized.

It should be noted that on the under surface of the liver, just beyond the gallbladder fossa, there was a small circumscribed, elevated nodule which was of a deeper color than the remaining portion of the liver. This presented a firm consistency; it was not nodular. For fear of getting into uncontrollable bleeding I did not excise this mass which appeared to be inflammatory, rather than malignant.

He has gained in weight; the jaundice has not recurred and he has been able to return to his work.

Comments. This patient was markedly jaundiced, emaciated, and it was impossible to arrive at a definite diagnosis in spite of the fact that all of the laboratory tests, including Van den Burgh both direct and indirect, were utilized.

The preoperative diagnosis was cholecystitis and cholangitis. The possibility of a carcinoma of the ampulla vater had to be considered. The x-ray diagnosis was perforating duodenal ulcer.

At operation, as will be noted by the first operative record as well as at second, we found no evidence of a malignancy.

The first operation consisted of a simple cholecystostomy. At the second a cholecystectomy was done. He has remained well since the last operation.

SUMMARY

1. In gallbladder cases emergency operations are comparatively rare.

2. In acute cholecystitis, if there is evidence pointing to perforation, empyema or gangrene, operation is an emergency procedure.

3. Cholecystectomy under these conditions may prove disastrous.

4. Cholecystostomy should be done, and at a later date cholecystectomy can be performed with less danger to the patient.

PERFORATION OF GASTRIC AND DUODENAL ULCERS

Perforation of gastric and duodenal ulcers requires immediate operative intervention, if the patient is to be saved. The results obtained will depend entirely on the accuracy of the diagnosis and the length of time after the perforation occurs that operative intervention is instituted. It is possible to confuse at times a perforation with an acute appendicitis, but as a rule that diagnosis can be made if the symptoms are properly interpreted.

When perforation of gastric ulcer occurs in elderly people, confusion sometimes exists and a diagnosis of retroperitoneal hernia, or even acute appendicitis is made. Perforation is not unusual in the fifth and sixth decades.

The symptomatology and clinical findings in perforation present, as a rule, a definite picture. The radiogram can be of great value because of the finding of a gas bubble between the liver and the dome of the diaphragm which causes elevation of the latter.

The type of operation must depend largely on the condition of the patient and the skill of the operating surgeon. In those cases where it is expedient to do nothing more than close the perforation, if this closure does not interfere with the lumen of the pylorus, this procedure may be all that is necessary and certainly will suffice as a life saving measure. Other operations may be done at a later stage.

The usual story in perforating gastric ulcers is well illustrated in the following cases.

Case 14. Mr. L. S. (1928). History. Abdominal pain began about 10 p.m., when he was attending to his duties as a policeman. The pain was so severe that it was necessary for him to sit down. He had a desire to vomit, but could not.

On admission to Touro Infirmary (11 p.m.) physical examination revealed a well nourished young man who was not particularly pale, but whose face presented an anxious expression, indicating an intense pain. Pulse 90, good volume. Abdomen was rigid, particularly in the upper segment. The radiologist was called and requested to make a picture of the abdomen.

The patient was taken immediately to the operating room. The operation was performed within two hours of the onset of his pain. A large quantity of fluid was found which was cloudy and contained many particles of digested food.

As soon as packs were introduced, the stomach came easily into view, and immediately over the pylorus we could see an opening, through which the gastric contents were spilling into the abdominal cavity. The stomach was picked up and the discharge of its contents stopped in this way. Packs were introduced and the opening closed, transverse to the axis of the bowel. Two layers of sutures introduced; first row, chromic catgut, second row, fine linen.

The patient's condition was good, except that the anesthetist informed us he was slightly cyanosed and for that reason we did not proceed with a gastroenterostomy. His recovery was not marked by anything unusual.

Case 15. Mr. W. G. (May, 1914). Diagnosis: Perforating gastric ulcer. This young man had complained of an abdominal pain for two weeks. Nausea without vomiting had been present during this period. The pain had never been severe enough to cause him to go to bed. He had had a similar attack one year before. In the interval he had had sour eructations following the ingestion of food.

When first seen at 1 p.m. in the office, we found no evidence of rigidity but some epigastric tenderness and some pain to the right and left of the midline. Below the umbilicus there was no pain. This young man was a medical student and the day of examination antedated the close of school by about two weeks. For that reason I felt it might be possible to delay interference until the close of school.

At 5 p.m. of the same day I was called because the patient had violent abdominal pain localized in the upper portion of the abdomen. He had not vomited. His temperature was 99°, pulse 80. Marked rigidity to the right of the midline above the umbilicus. Pain was so acute that he could not bear the touch of the hand. He was immediately transferred to the Presbyterian Hospital, where he was operated upon.

At operation (two hours later) we found a large quantity of gastric contents pouring into the field. A perforation was found in the first portion of the duodenum. The edges of the ulcer were very friable and with great difficulty the perforation was closed because sutures did not hold. Gastroenterostomy was not done.

The patient, with the exception of a development of a fistula, had no trouble. He left the hospital two weeks after the operation and seven weeks after operation the fistula had closed. His weight at that time was 158 pounds.

This operation was performed fourteen years ago. The patient was seen about one year ago, at which time he weighed about 185 pounds. He has had no further trouble.

There are cases which demand subsequent operation, where the original operation consisted of closure of the perforation alone. Secondary operation may demand excision of the ulcer or that combined with gastroenterostomy, or even more radical procedure.

This is illustrated in the case of Mr. P. S.

Case 16. February 9, 1922, I was called to see patient because of intense abdominal pains which began while he was at work at 4:30 p.m. Immediately he went home to bed. Pain was more marked in the epigastrium and right iliac fossa. He had not vomited up to the time I saw him. When seen at home I found patient very pale, sitting upright; he had the facies of intense pain. Temperature subnormal, 97.8°. Pulse 80, good volume, regular.

Abdominal examination. All of the muscles contracted. The greatest amount of tenderness was noted in the epigastrium and iliac fossa. There was marked dulness below the umbilicus. Hyperresonance in epigastrium. Taken immediately to the Touro in ambulance, where a leucocyte count was made, 19,500, 85 per cent neutrophiles. He was immediately operated upon.

Operation. High right rectus incision. When the peritoneum was opened a large quantity of thick, yellowish fluid with air bubbles discharged from wound immediately. The peritoneum was thickened and examination of the stomach from the cardiac end to the pylorus revealed nothing on the anterior of the body of the stomach. The perforation was about one-sixth of an inch in diameter. Its walls were thickened and its edges everted. We could see the chyme pouring out of the opening which was closed with chromic gut sutures. A small quantity of greater omentum was sutured over the opening as a protective covering.

A gastroenterostomy was not done for two reasons; first, because I did not believe the man's condition justified any further operative procedure; and, second, because the sutures did not cause sufficient constriction to obstruct the pylorus.

This patient required a second operation eight months later because of recurrence of the symptoms. At this time a gastroenterostomy was done. Since the second operation, October, 1922, he has gained about fifty pounds in weight and never has had digestive disturbances.

Case 17. Mr. E. P., age 22 years (1914). Patient complained of "indigestion" for three weeks. Abdominal pain February 15. He took a dose of salts, bowels acting within the hour. Pain persisted and began to localize around the umbilicus. Not being satisfied he took five grains of calomel.

On admission to Touro his temperature was 99°, pulse 102. There was pain on pressure all over the abdomen, particularly in the right iliac region, also the epigastrium, with rigidity of both recti. Leucocyte count 17,000, 94 per cent neutrophiles. Preoperative diagnosis, acute appendicitis.

Operation. Large quantity of seropurulent material was seen. The appendix was covered with flakes of fibrin. Appendix was removed. Further exploration, because of the great quantity of fluid, showed a perforation on the anterior wall of the stomach close to the pylorus. The perforation was closed. Gastroenterostomy was not done.

Patient left the hospital three weeks after operation. A letter received from him April, 1923, stated that he had developed tuberculosis and he had recently been having "stomach trouble."

Comment on cases. The history of indigestion, the sudden acute diffuse abdominal pain and the generalized rigidity, without nausea and vomiting, probably should have directed attention to the possibility of a perforation. The fact that the appendix was covered with flakes of fibrin and was itself acutely inflamed shows how easily a case of this kind may have been closed without further search for the cause, and the patient probably would have been lost because of the failure to recognize a perforating gastric ulcer.

Case 18. Mr. B., age 63 years (1924). Acute abdominal pain 5 p.m., October 29, epigastric and right iliac in character. Patient vomited.

Examination showed a man past middle age, well nourished and apparently acutely ill. Abdomen extremely rigid. Greatest pain and rigidity in the epigastrium. Leucocyte count 15,500, 86 per cent neutrophiles.

Patient kept under observation for about four hours. Since the symptoms did not abate, he was operated upon and we found a perforating gastric ulcer. A large quantity of stomach contents was seen pouring out of the perforation which was closed and the omentum sutured over the site of the perforation to act as a buffer.

The convalescence was uneventful and the patient left the hospital eleven days after operation. When last heard from, about six months after operation, he was feeling perfectly well.

Another type of surgical emergency is one, in which there is a gastric hemorrhage. A word of caution should be given here against surgical intervention with a view of trying to find the bleeding vessel. Gastric hemorrhage may be associated with esophageal varicosities and with varicosities in the stomach, or with diffuse hemorrhage from the stomach not particularly because of erosion of a vessel. Archibald of Montreal has called attention to this and has advised transfusion in preference to gastrotomy.

There are times when gastric hemorrhage is associated with gallbladder and hepatic diseases. In some of these instances drainage of the gallbladder may prove all that is necessary. This is illustrated in the case of Mrs. E. M.

Case 19. Patient, age 39 years (1925). History. Epigastric pain which had become more intense and was of the varying character. Pain was not increased by eating, but was less severe after vomiting. She had vomited blood several times. On the night of July 20 she vomited a large quantity of blood.

When admitted to the hospital her pulse was 130, temperature normal. She was pale, but did not present a picture of an individual in shock.

Preoperative diagnosis: Ulcer of the stomach, gastric hemorrhage. Postoperative diagnosis: Cirrhosis of liver, cholecystitis, cholelithiasis, probable esophageal varices.

Operation: High right rectus incision. Large amount of fat both properitoneal and subperitoneal. When the peritoneum was opened, there was no fluid found. The liver was seen to be very large, rough and presenting a mottled red and gray appearance. The gallbladder was thick-walled, of grayish hue and was distended. The stomach came into view. There were no adhesions about it. Its walls throughout presented the same consistency. No infiltration of the stomach walls either on the lesser or the greater curvature. The pylorus was perfectly free. No evidence of thickening. The first portion of the duodenum presented no abnormality, no infiltration nor evidence of ulcer.

To make certain there was no ulcer, a gastrotomy was done and a Cameron light introduced. No blood was found in the stomach. The rugae presented nothing abnormal. Sponge introduced into the stomach came away without more than a simple blood stain. The stomach was then closed, three tiers of chromic catgut being used. The gallbladder was palpated and we found two small stones. Inspection of the small intestines showed they were filled with a dark bluish-looking material, giving the impression that there was blood in the bowel, hence giving evidence of cholecystitis, hepatitis with stones in the gallbladder. It was thought expedient to drain the gallbladder and remove these stones. This was done. Chromic catgut used and Pezzar catheter introduced. Two small mulberry stones removed. The bile was thick and almost tar colored. The cystic duct was patent. Pancreas was palpated and no indurations found. Abdomen closed in tier suture. Patient left table in good condition. Patient is living and in good health today.

While on the subject of hemorrhage one cannot pass without a word regarding those cases in which hemorrhage is part of a disturbance of the recticuloendothelial system. In a case of purpura hemorrhagica, after proper investigation of the laboratory findings, transfusion followed later by splenectomy will give the most spectacular result.

In this particular paper we will limit our discussion of traumatic emergencies to rupture of the abdominal viscera. Rupture of a hollow viscus is uncommon, excepting the bladder and that in conjunction with fractures about the pelvis. Rupture of a solid viscus, such as the liver or spleen, is relatively uncommon, but this should not deter us from looking for it, following violent injury to the abdominal wall. It must be remembered in dealing with these that pain is not a prominent manifestation. The patient does not show evidence of shock until hemorrhage has been severe.

During the first few hours following rupture of a solid viscus an anemia is not evident from the blood picture. In two cases of rupture of the spleen, which I have seen and operated upon, the red blood count was respectively 4,565,500 and 4,950,000; hemoglobin respectively 65 and 83. Hemorrhage is associated with leucocytosis. These phenomena have been accepted by most of the authorities for many years.

The physical findings, as a rule, when there is a rupture of one of the solid organs, are marked pallor, rapid respiration, low tension pulse, abdominal pain, rigidity of the abdominal muscles, dulness on percussion of the abdomen and fulness in the posterior cul-de-sac on rectal examination.

There are two definite indications in these cases, immediate operation and transfusion. It is not sufficient for the surgeon to satisfy himself with "internal injuries," and wait for the postmortem to reveal the fact which may have been obtained at operation, and a life possibly saved.

OPERATIVE EMERGENCIES

I think this subject may be discussed under the following headings:

1. The finding at operation of an unexpected condition. This is considered an operative emergency because it demands resourcefulness and prompt decision.

2. The injury to an important vessel or hollow viscus.

We might begin by asking the following question, "Did it ever happen to you?" Did you ever find at operation, when operating for what seemed to be a simple indirect inguinal hernia, that you were dealing with a sliding hernia? Have you ever been unfortunate enough to injure the common duct in doing a cholecystectomy? Has hemorrhage, while doing an appendectomy or cholecystectomy, ever given you concern at the table?

Under the heading of findings at operation of the unexpected condition, every surgeon of experience has been forced at times to admit before operation that the diagnosis in some cases has been undetermined and for that reason the expression, exploratory laparotomy, has been coined. These operations are becoming less frequent as the diagnostic acumen of the operating surgeon and his medical confreres increases. But in spite of all laboratory aids there are times when one will find the unexpected condition at the table. Such an instance is illustrated in the following case:

Case 20. Mr. S. O. W., age 68 years. Patient complained of an epigastric pain which had existed for two months. Great loss of weight. Five weeks before coming under observation he had had an attack of abdominal pain which he was unable to get rid of. Went to an institution where he was purged daily.

Since admission to Touro Infirmary on medical service, he had vomited only one time. No eructations.

Examination: Patient very much emaciated. Skin dry. Mucous membranes normal in color. Abdominal findings. Fulness below the umbilicus. Superficial veins well marked. There is a visible peristalsis. In the upper portion of the abdomen no definite mass could be palpated.

The x-ray findings suggested a perforating gastric ulcer. On account of the patient's age, great loss of weight, icteric tinge of skin, and the filling defect in the colon as well as in the stomach, the clinical findings seemed to indicate the probability of a carcinoma either of the stomach or transverse colon.

At operation we found a subphrenic abscess which had been walled off from the abdominal cavity by plastic exudate which held the stomach firmly out against the liver and diaphragm. As soon as the stomach was separated from the liver there was a spilling of some of the contents in the cavity. This necessitated immediately an intercostal drainage of the subphrenic accumulation, also an effort to cofferdam the opening leading into the general cavity.

Another type of operative emergency occurs in connection with gallbladder surgery, where during a cholecystectomy the common or hepatic duct is injured, due to an anomalous angle formed by the two ducts. If one sees a spilling of bile into the cavity, after the ligation of the stump of the cystic duct, careful search should be made for the injury in the hepatic or common duct. This emergency had best be met by introduction of a tube into the duct or by suture.

Such an experience once had will never be forgotten. In connection with this the following brief summary may be cited:

Case 21. Mrs. K. P. (1916). Operative diagnosis: Empyema of gallbladder, cholelithiasis, cystic duct obstruction.

The gallbladder walls were extremely thick, as were the walls of the cystic duct. After ligature had been placed around the cystic duct which was severed between ligatures and the clamp removed, we saw there was a drainage of bile from a lateral wound in the hepatic duct. A small rubber tube was introduced in the hepatic duct. This drained bile freely prior to closure of the abdominal wound.

In citing the above emergency those who have not been unfortunate enough to have such an experience may be inclined to be a bit critical.

One of the most interesting of all surgical emergencies is that which occurs in the course of apparently a simple indirect inguinal hernia, when one finds that instead of a sac there are apparently adhesions everywhere and these "adhesions" when cut bleed very freely. Some have had the experience of opening what they thought was a sac and found they were within one of the hollow viscera, particularly the cecum or bladder. An attempt to separate the expected sac from the surrounding tissue is met everywhere by increasing bleeding.

I recall being present in the operating room when a surgeon was in such a dilemma, and he was unaware that he was dealing with a sliding hernia. The so-called adhesions were in reality the vascular supply to the cecum and the ascending colon as they wound around the posterior parietal peritoneum from the roots of the mesentery. He accepted the suggestion that he make a second incision after the plan of Moschowitz. Immediately his difficulty was overcome.

Until the recent work of Moschowitz the difficulties incident to this particular operative emergency were very great. His suggestion of making an incision along the outer border of the rectus muscle as for an appendectomy, and introducing a pair of sponge forceps from above to bring the abdominal viscera back into the cavity makes it very easy to deal with this particular condition. Nothing can be more embarrassing than to have a condition of this kind and not know just what to do with it.

In this connection I am reminded of the story of a certain doctor who was operating on a patient with a hernia. Someone asked, "Suppose that the hernia returns what will you do?" His reply was, "Then the patient can wear a truss." It is fortunate that there are few such men.

Hemorrhage during the course of an abdominal procedure, whether it be an appendectomy, cholecystectomy or other condition, can produce a great deal of trouble. Indiscriminate clamping without having a clear field is to be deplored. The introduction of suture blindly into the depths may do untold harm. A good exposure and an attempt to obtain a clean field will enable one often to see bleeding points. Do not close an abdomen unless you are satisfied that all bleeding is controlled.

Operative emergencies will be few in the hands of the experienced surgeon in proportion as his assistants are trained each to do his particular work and not everybody attempt to be the operating surgeon.

POSTOPERATIVE EMERGENCIES

The postoperative emergencies may be immediate, as those which occur from shock, hemorrhage; those that come on after twenty-four or forty-eight hours, such as the acute toxemias following cholecystectomy, and those which occur at a later time, such as alkalosis, evidence of an obstruction or an ileus, fecal fistulae and postoperative eventration. Many more might be mentioned, but those grave emergencies will supply a sufficiency for this particular reminiscence.

Postoperative shock from hemorrhage fortunately is diminishing and shock from all causes will decrease in the hands of the individual surgeon in proportion to his experience, technical skill and the duration of the operative procedure. Shock due to hemorrhage can be combatted in only two ways: first, the surgeon must not lack the courage to reopen the abdomen for the purpose of finding the bleeding points; second, transfusion and morphin represent the only measures which are of immediate value.

The acute toxemias which follow a cholecystectomy and which are characterized by a marked febrile reaction, vomiting and tachycardia can only be combatted symptomatically.

Alkalosis, evidence of obstruction or of an ileus, is indication for the use of large quantities of saline intravenously by hypodermoclysis and proctoclysis. At the same time relief of the obstruction is obtained by the introduction of the Pezzar catheter in the first loop of distended bowel which presents on opening the abdomen.

Postoperative eventration is one of the unfortunate surprises which the surgeon may find when he goes to dress a patient, particularly if he has been vomiting and there is distention of the abdomen. To say the least, this complication is disagreeable, but it is one which every surgeon of experience probably has faced. The indication is immediate resuture of the abdominal wall.

This is only a brief summary of some of the causes of premature old age found among surgeons. To lessen these complications we must be continually on the alert for anything which will make us better diagnosticians as well as better technicians.

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UNUSUAL INCREASE OF CARBOHYDRATE TOLERANCE IN CASE OF JUVENILE DIABETES

E. R. Blaisdell, Portland, Me. (*Journal A. M. A.*, Sept. 29, 1928), reports the case of a child, 11 years of age, showing symptoms of diabetes for only two weeks, who went into coma and was saved by large doses of insulin. A few months later she was able to discontinue the insulin on an 1,800 calory diet, containing 80 gm. of carbohydrate. After one and a half years she was still sugar free with a normal blood sugar, without insulin.

CLINICAL AND LABORATORY FINDINGS

THEIR COMPARATIVE INTERPRETATION AND VALUE*

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Diagnosis is fundamental in the practice of medicine. Upon its accuracy depends largely our success in rendering an intelligent prognosis and instituting scientific treatment. It is essential that patients be studied from all avenues of approach, but in addition a proper comparative value and interpretation should be placed on all findings. This is one of the most difficult lessons to learn and, as a result, patients are only too frequently treated unscientifically, too much having been taken for granted.

The history and physical examination are of inestimable value in helping us to select the type of laboratory tests which are essential and should always precede special examinations. A failure to observe this paves the way for the practicing of poor medicine, as it encourages the utilization of short cuts and throws the burden of proof on the laboratory man.

It is important that we realize the need for the repetition of certain tests. This applies equally to phases of the physical examination and the history. Repeated questioning, usually on subsequent days, often brings out information which aids very greatly in the inventory of a case. Our attention should be focused especially on the organ which the symptoms would indicate to be involved. For example, if a patient shows cardiac symptoms, after a thorough examination has been done it is advisable to concentrate on the heart and related organs, reexamining these parts, as well as carrying out laboratory tests which throw light on their probable impairment.

Many examinations which fall in the domain of the laboratory are almost mathematical in their precision and accuracy. This applies especially to the staining of smears, tissue diagnosis, blood chemistries, etc. Such examinations encourage the clinical pathologist to become dogmatic, and treatment of a patient is often instituted which is entirely dependent upon his findings, that ideal, cooperative type of treatment based on all the evidence is neglected, and the possibility of effecting a cure is markedly lessened.

The examination of the urine, while of extreme importance, is in the eyes of the layman, an index of the health or disease of the body as a whole. This idea has been fostered by the tendency of certain commercial laboratories and so-called health centers to render reports on urines sent to them. Too much significance is attached to the presence of indican in the urine. Large amounts may occur in patients enjoying perfect health. The presence of albumin in the urine certainly calls for a very thorough investigation before assuming that nephritis is present. Transient albuminuria is commonly present in acute infectious diseases and at times with no explainable reason. Orthostatic albuminuria should always be ruled out. A mild persistent albuminuria after the age of sixty is frequently present in spite of normal kidneys. The same applies to hyaline casts. The latter may occur without significance in younger individuals.

Glycosuria, while usually denoting diabetes, calls for a complete investigation to rule out glycosuria due to such factors as excessive sugar intake, renal diabetes, cerebral conditions, that due to lessened tolerance, etc. One is hardly justified in classifying all patients who exhibit a lessened tolerance for sugar as being definitely diabetic.

Twenty-four hour urine examinations are of much more value than single examinations. Mild cases of nephritis, and especially mild cases of diabetes, may be discovered through this precaution.

A complete blood count should be routine in all cases requiring complete study. This allows for the discovery of such conditions as lead poisoning, polycythemia, myelogenous leucemia, etc. In the latter two the diagnosis is made on the blood findings.

The differentiation between secondary and pernicious anemia cannot ordinarily be made from the blood count alone. Normoblasts as well as megaloblasts may occur in secondary anemia. A color index of 1 or greater than 1 is important evidence for pernicious anemia, but not absolutely diagnostic. The volume index of Capps is the most important diagnostic blood test in the differential diagnosis of pernicious and secondary anemia.

The leucopenia associated with typhoid is a valuable point in the diagnosis but hardly diagnostic. The frequency of a low leucocyte count in influenza and influenzal pneumonia bears this out very strikingly.

The high leucocyte count with the associated high percentage of lymphocytes which occurs in acute glandular fever makes for occasional difficulty in the differential diagnosis of that condition from lymphatic leucemia. Such conditions as a ruptured viscus with an associated peritonitis may be associated with a subnormal rather than an increased leucocyte count.

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* Read before a meeting of Southern California Medical Association, Santa Barbara, Calif., April 6, 1928.

The blood Wassermann test, while of extreme value, is far from infallible. A positive Wassermann should, in the absence of clinical evidence, always call for repetition of the test and the use of the provocative Wassermann, especially if the second test has been negative. False positives, while not common, do occur, and have been the means of convicting many of syphilis who really never had the disease. Treatment once established makes it impossible to determine whether or not lues had ever been present in the event that all subsequent Wassermanns are negative.

In tabes dorsalis the blood Wassermann test is positive in approximately only 35 per cent of cases. Paresis, on the other hand, gives a positive Wassermann in practically 100 per cent of cases. It should be understood that occasionally a patient may be clinically cured and still may never become Wassermann-negative. In these cases considerable difficulty may arise in determining what course to pursue. Spinal fluid examinations, the Kahn test and central nervous system examinations should be repeated from time to time.

Blood sugar findings beyond normal limits occur in diabetes. The upper limit of normal blood sugar up to the age of fifty might safely be put at 130 milligrams per 100 c.c. Occasionally patients with arteriosclerosis who are beyond that age may show readings up to 200 and still be free from diabetes. In diabetics beyond the age of fifty-five to sixty extreme difficulty may be encountered in attempting to lower the blood sugar below 200, due to arteriosclerotic changes. In our treatment this fact should always be borne in mind, otherwise a patient may be kept on a lower diet than is necessary and be harmed thereby.

The estimation of the blood urea, urea nitrogen, creatinin, etc. are invaluable in the determination of kidney function. This is especially true in nephritis moderately or considerably advanced. Early nephritis may show these readings to be within normal limits. Creatinin readings of 6 or over augur a very serious prognosis.

Phenolsulphonephthalein tests may be misleading in the determination of kidney function. An output of 65 to 80 per cent may occasionally occur in kidneys which are considerably damaged. On the other hand, a very low output of 10 to 20 per cent may not be inconsistent with fairly intact kidneys.

Prostatic hypertrophy, as well as certain of the acute nephritides may, after showing marked kidney impairment as manifested by all tests, eventually show evidence of normal renal function subsequent to the institution of corrective measures.

Gastric analysis should be more of a routine procedure than is usually the case. A hyperacidity calls for further investigation to rule out gastric or duodenal ulcer. Functional hyperacidity is very common, and the determination of its presence aids in our measures of treatment. Anacidity has a definite significance. It is important to bear in mind that approximately 50 per cent of patients with cancer of the stomach may not show an achylia. Also that achylia may occur in the presence of a gastric ulcer.

Patients with pernicious anemia have achylia. Most authorities question the diagnosis of pernicious anemia if hydrochloric acid is present. According to Bennett, 4 per cent of normal individuals have achlorhydria. Owing to the inferred predisposition of patients with achylia to develop pernicious anemia, the determination of its presence or absence is of vital importance. The advisability of giving large doses of hydrochloric acid throughout life to patients with achlorhydria, as suggested by Hurst, deserves serious consideration. Immediate relatives of patients with achlorhydria or pernicious anemia should be examined for the possible presence of achylia. All persistent diarrheas call for a gastric analysis, as achylia is very frequently the cause.

The blood coagulation time is indicated in all operative cases. This is especially true where jaundice is present. Prolongation of the coagulation time to thirty minutes may occur in jaundice, and in such cases the routine procedure of giving calcium chloride injections prior to operation, as brought out by Walters, has greatly reduced the mortality.

In obstructive gastric or intestinal lesions, where vomiting persists, the estimation of the blood chlorides and the determination of the carbon dioxide combining power are of vital importance. The resultant alkalosis causes a reduction in the blood chlorides and carbon dioxide combining power. Administration of sodium chloride by rectum instead of soda is, therefore, indicated to restore the normal ratio of the acid base radical.

Blood cultures are of great clinical assistance in the diagnosis of typhoid fever. The fact that they are more prone to be positive in the first week adds much to the value of this test. It should be understood that after the second week such cultural findings are frequently negative. In the diagnosis of septicemia blood cultures are invaluable. Frequent tests are often needed before a positive finding is obtained. While certain cases of septicemia may recover, those associated with a malignant endocarditis are practically always fatal.

Stool examinations are of great value in the demonstration of blood, pus, typhoid bacilli, various types of worms and parasites. In testing for parasites the patient should be given a saline cathartic and the first liquid stool examined. Examination of solid stools for parasites is practically valueless.

The metabolism test is of vital importance in the determination of the degree of toxicity in goiter patients, and especially in the diagnosis of borderline cases. Repeated readings in doubtful cases and especially the carrying out of the test by one especially trained, and with the patient under normal conditions, is of vital importance. In a former article I stated, "I have repeatedly seen patients who have previously been considered hyperthyroid on the basis of one reading, upon whom a subsequent reading would, I am sure, have been normal." As a matter of fact, in my experience a rate of plus 11 to plus 20 or 25 on being rechecked proves, in most cases, to be within normal limits. There are isolated cases of hyperthyroidism which present a low reading, but in these the symptomatology is in harmony with the rate, and such cases are quite often recognized by the clinical symptoms. These points cannot be re-emphasized too frequently, as the tendency to base false conclusions on poorly conducted metabolic readings is becoming increasingly more prevalent.

Increased rates are constantly present in exophthalmic goiter and hyperfunctioning adenomata, in the active stage of acromegally and in fevers. They are found occasionally in other diseases, such as essential hypertension, pernicious anemia, leucemia, diabetes, bronchial asthma, decompensated hearts, tuberculosis and carcinoma.

Special examinations, such as electrocardiographic tracings, are of great value in heart cases. While a negative tracing does not exclude cardiac trouble, positive tracings are of great value in the diagnosis of certain cardiac abnormalities. The diagnosis of heart block and auricular flutter are notable examples of the aid afforded by electrocardiography. It has its greatest value in the determination of myocardial damage, coronary disease and impairment of the conduction system, as well as furnishing a prognosis in this class of cases. The significant findings in the tracings are aberrations of the Q R S complex in all derivations, as well as T wave negativity in lead I, lead I and II, or lead I, II, and III. Electrocardiography is of little value in the determination of valvular involvement or in the estimation of the degree of cardiac enlargement.

The x-ray has become an invaluable agent in the practice of medicine. By its use, in the hands of an expert, the diagnosis of gastric and duodenal ulcers can be made in approximately 90 per cent of cases. The diagnosis of malignancy in its very early stage is dependent upon fluoroscopic and x-ray findings. Tuberculosis of the bowel, ulcerative colitis, and early bowel malignancies require x-ray examinations to establish definitely their presence.

The determination of gallbladder disease has been materially aided by dye study. Involvement of the appendix can frequently be determined by x-ray study. Bone lesions, and pituitary disease can frequently be determined where other means of examination fail. It is of vital importance in x-ray interpretation that deductions be made from the actual findings rather than predicated on questions propounded to the patient. The clinician himself should then weigh all the evidence and form a diagnosis. An x-ray examination alone may be correct in many cases, but it has not the degree of accuracy possessed by a diagnosis made on all the evidence. Deformity of the duodenal bulb at times may mean adhesions instead of ulcer. Lung infiltration from an x-ray standpoint may indicate active tuberculosis, whereas clinical evidence may show the lesions to be healed.

Many more illustrations might be cited. Of course, many tests have not been mentioned here, but the same principle applies in our interpretation of all of them. There is definite need for the study of our cases from every angle, and there is likewise that very great need for a balanced interpretation of each test, as well as the understanding of its comparative diagnostic value.

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PYELONEPHRITIS *

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Pyelonephritis in its various forms is the most common disease met with by the urologist. In this paper I will consider only the nontuberculous forms of renal infection.

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The term pyelonephritis should include all cases of the so-called pyelitis. It is impossible to differentiate between infections confined to the renal pelvis and those involving the straight tubules. It is my belief that real pyelitis is extremely rare and it is better to speak of all cases as pyelonephritis.

It is very important for us to differentiate between pyelonephritis and Bright's disease, in which there is marked disturbance with the kidney function which rarely occurs in pyelonephritis. The differentiation can generally be made by the presence of casts and a large amount of albumin in the urine and the presence of edema. In the ordinary case of pyelonephritis casts are rarely present and the amount of albumin is not large. It is not uncommon to find cases of pyelonephritis on a strict nephritic diet, which is not necessary. On the contrary, I am inclined to let them have almost anything in the way of food they desire.

There is such a marked difference between acute and chronic pyelonephritis that I think it well to consider the two separately. Acute pyelonephritis usually comes out of a clear sky with sudden prostration, frequently accompanied with chills and fever, and with or without bladder irritability. These frequently are followed by a dull ache in one or the other kidney area and at times by severe colic, caused by the passage of a plug of mucus or pus down one ureter. Frequently there is nausea and vomiting.

The first symptoms may be any one of those above mentioned. In some cases there is first a little bladder irritability, followed later by fever and pain. In some the only symptoms are referable to the bladder. Occasionally the attack is ushered in by hematuria, which may come either from the kidneys or the bladder. Some even very severe cases never have any bladder involvement. I have seen very acute cases with pus and motile bacilli in the urine, in whom cystoscopic examination showed a perfectly normal bladder. Then again you see a case with the same urinary findings and the same bacteria, where the bladder looks like a piece of beefsteak. I have never been able to answer the question why one will have an infected bladder and another will not. The English have a very apt term for the agony these cases of severe cystitis have. They call it strangury. When you see a woman crying out at the end of micturition, you appreciate how applicable it is.

A thing to be borne in mind in both acute and chronic pyelonephritis is that the condition is almost always double, although it is usually more severe on one side. The urine from the kidney that is not giving symptoms will nearly always show leucocytes and bacteria. This should always be considered, when one is tempted to do a nephrectomy on an acute kidney which is enlarged and tender. It is my opinion that it is extremely rare that a nephrectomy is indicated in acute pyelonephritis.

I well remember a girl I saw several years ago with acute pyelonephritis of pregnancy. It started on the left side and later shifted to the right. The right was so acute and the patient so sick that I became afraid of perinephric abscess. As she was a Catholic, abortion was forbidden.

Under procaine I cut down on the right kidney and found no perinephric abscess but did find the kidney much enlarged and covered with minute yellow abscesses. It looked like a perfectly hopeless kidney. Knowing that the left kidney was also infected, I fortunately did not dare do a nephrectomy. I merely decapsulated. Following the operation the patient miscarried. In three weeks she was entirely well and the urine was free of pus and bacteria. Of course, there must have been some kidney destruction during the resolution of these minute abscesses.

In a paper a few years ago I laid down some axioms regarding pyelonephritis which still hold good.

1. Acute pyelonephritis in an otherwise normal kidney tends to get well.

2. Recurring attacks, no matter how slight, should be investigated by pyelograms.

3. If attacks recur in kidneys that have been proved to be normal otherwise, focal infection should be looked for, especially devitalized teeth, tonsils and intestinal stasis.

4. Pain is not a constant nor a reliable symptom either in simple pyelonephritis or in pyelonephritis developing in an abnormal kidney. Many times pyelonephritis developing in an abnormal kidney, that is, in the presence of stones, kinked ureter, etc., may entirely destroy that kidney without localized pain ever being present.

5. Every case of pyelonephritis should have the urinary sediment followed after subsidence of symptoms. If red cells or leucocytes or bacteria persist, pyelograms should be done. A kidney rarely becomes destroyed without tell-tale evidence in the urinary sediment.

Any of the pus-producing organisms may produce pyelonephritis, but by far the greater proportion are caused by the colon bacillus. Occasionally we find the urea-splitting organisms but fortunately they are rare, as they are very difficult to treat. I think that most observers today are agreed that in most cases of pyelonephritis the infection is blood borne. I think this is true, even in the cases where there may be obstruction to the passage of urine resulting in dilatation of ureters. I am a strong believer in the importance of focal infection as the source of trouble in both acute and chronic pyelonephritis. So many cases follow a cold, acute tonsillitis or infected teeth. I feel so strongly about devitalized teeth that I am not willing to treat a case of chronic pyelonephritis unless he is willing to sacrifice all pulpless teeth, irrespective of what the radiograms show. I agree entirely with Bumpus and Meisser that frequently the worst offenders show no apical destruction in the radiogram.

There are certain factors which predispose to pyelonephritis. Lowered resistance from overwork, lack of exercise, exposure, neglect of the bowels, etc., are apt to be factors. How often one sees an attack come on after a person has been chilled by staying too long in cold water. Sitting in the cold, where the buttocks become chilled as one does at a football game, is a common factor. Anything that interferes with the outflow of urine from the kidney, such as kinked ureter causing hydronephrosis, stricture of the ureter, pressure on the ureter, stone in the kidney or ureter, obstruction to the outflow of urine from the bladder, causing back pressure on the kidney, render a kidney very susceptible to infection. This is why pyelonephritis is such a common accompaniment of stricture and obstructing prostates.

As I stated earlier, the symptoms vary a great deal. Some people have merely chills and fever and are mistaken for malaria. There may be no pain or it may be very severe. There is usually tenderness at the costovertebral angle, but not always. There may or may not be bladder irritability. One thing that has struck me many times is that early in the disease these patients do not look so sick as their chart does. It is not uncommon to see one of them who has a high fever and yet does not feel especially sick.

The diagnosis, of course, rests largely on the examination of the urine. It will always contain pus and bacteria, except rarely when a ureter is temporarily blocked by a plug of mucus. Red cells may or may not be present. At times there is gross hematuria. The amount of albumin usually is not very great. Casts in an uncomplicated case are rare.

When it comes to treatment, the question always arises, shall we cystoscope the acute case. Personally I prefer to wait until the acute symptoms subside. If I have reason to suppose that there is hydronephrosis, as you frequently get in pyelonephritis of pregnancy, then I do pass a catheter up the affected side and drain the pelvis. I rarely leave in a ureteral catheter as some do, as I feel that this always stirs up a certain amount of ureteritis. My reason for not cystoscoping the acute case is that it is a considerable procedure for a sick person and usually not much is gained by it. I have seen an acute kidney made worse by such a procedure. Pelvic lavage in the acute cases I do not approve of.

The most important thing is to force fluids. This cannot be overemphasized. It should be started at once and forced to the limit. Frequently the patient is nauseated and can take very little by mouth. Such cases should be started at once with large amounts of fluids either intravenously or by hypodermoclysis. I give a liter every eight hours until I get the output of urine up to one hundred ounces in twenty-four hours.

For medication, if the urine is acid, I render the urine alkaline and keep it so during the acute stage. I do not care especially what drug is used. Large doses of potassium citrate will do the work. After the acute stage is passed I use either nothing or acid sodium phosphate and urotropin.

I am inclined to be liberal with the diet and allow solid food as soon as desired, irrespective of the temperature. It, of course, is important to keep the bowels open. Something that does not deplete the system of water should be used as a laxative.

As I have said before, it is very rare that nephrectomy is indicated. Of course, we all see an occasional case where we are dealing with an abnormal kidney and a nephrectomy becomes necessary. What I wish to bring out is that in the ordinary case of acute pyelonephritis surgery is not indicated. I feel that a great many kidneys have been sacrificed that would have got well if left alone.

Some cases are stubborn and do not yield readily to treatment. It sometimes becomes necessary to do pyelograms on these to make sure that you are not dealing with an otherwise abnormal kidney.

Patients, in whom the attack is their first and who clear up in a reasonable length of time and develop a normal urine, may be discharged without pyelograms. Those, however, who have had previous attacks or whose urine does not become free of pus and bacteria should have pyelograms done. Pyelonephritis developing in an abnormal kidney which does not drain properly will never get well without surgical interference. I think there are many cases of moderate obstruction at the ureteropelvic junction that never give trouble until an infection comes along. Such an infection once started goes gradually ahead until the kidney becomes destroyed, unless the obstruction is removed.

Before leaving the subject of acute pyelonephritis there is one point I want to call attention to and that is the possibility of secondary infection of the prostate and vesicles in the male. I have seen a good many cases, where pus persisted in the urine after the acute stage has passed and the kidneys are free of infection. Examination of the secretion from the prostate and vesicles showed much pus. These cases usually respond readily to treatment. Epididymitis in these cases is not uncommon.

Chronic pyelonephritis includes those cases who have an acute pyelonephritis and have failed to clear up, those who have had recurring attacks of acute pyelonephritis and those who have never had an acute attack but who persistently have leucocytes and bacteria in the urine with or without symptoms.

In handling these cases the first thing to do is to make a complete study of the whole urinary tract. This in many will show definite pathology that calls for surgical interference. It is in these cases especially that one wants to be on the lookout for faulty drainage of the kidney pelvis such as is caused by an aberrant vessel.

Having ruled out definite pathology, such as stones, hydronephrosis, unilateral congenital atrophic kidney, etc., there still remains quite a large group with no definite pathology or at the most some blunting of the calyces. Some of these we can cure, some relieve and some, at least in my hands, yield to no treatment I have given. The infection is nearly always bilateral.

First of all we must search for the source of infection. It is in these cases that I feel most strongly about pulpless teeth. Every possible source must be thought of. A chronic gallbladder or appendix may be the source. I agree with Braasch that some are associated with hyperthyroidism and clear up after the removal of the thyroid. I have seen many cases clear up entirely after the removal of infected teeth or tonsils.

To my mind internal medication plays little part in the treatment of these cases. If many colon bacilli are present, I sometimes try making the urine alkaline for a short time. I think that intravenous medication is of doubtful value. I have never yet seen vaccines help in the slightest.

There is no doubt but what pelvic lavage helps many and cures some; it certainly should be tried in any case. Various solutions are used. I have had best luck with 2½ per cent mercurochrome or 1 or 2 per cent silver nitrate. If mercurochrome is used, both sides can be injected at the same time. This can be repeated in a week. I inject 5 c.c. into each kidney pelvis. If silver nitrate is used only one side should be done, as this causes considerable reaction and there is marked desquamation of the cells lining the kidney pelvis. With silver nitrate at least two weeks should elapse between injections.

As I stated before, there is a group of cases that are not affected by any treatment. I have followed several people for many years who stay in excellent health but who are never free of leucocytes and bacteria. Braasch brings out an interesting fact that of two thousand cases of chronic bilateral pyelonephritis treated at the Mayo Clinic only thirty cases showed evidence of stone. It goes to show that there is more needed than simple infection to produce stones in the kidney. My feeling has always been that infection plus faulty drainage was an important element.

Perhaps you notice that I have said little about the importance of stricture of the ureter in these cases. I think that the occurrence of stricture has been greatly exaggerated and I still consider a real stricture rare except in tuberculosis.

A small percentage of the chronic cases have sufficient hematuria, usually unilateral, to call for surgical interference. In these I think a nephrectomy should be the last resort. A nephrostomy should be tried first. I have several such cases that have been completely relieved by draining the kidney for a week.

Before leaving this subject I want to mention a group of cases that can be much improved by a simple treatment. Many people, especially women who have had a long standing infection of the urinary tract, are left with very distressing frequency. A good deal of this is habit. I think that many of these have a certain amount of contracture of the bladder. Many of these patients can be entirely cured by dilatation of the urethra and a gradual dilatation of the bladder by hydrostatic pressure with a bland solution. By careful treatment the bladder capacity can frequently be raised from one hundred to four hundred cubic centimeters or more. Perhaps some day someone will tell us how to cure the stubborn cases that baffle us today.

STRICTURE OF THE FEMALE URETHRA *

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Stricture of the female urethra first interested me after reading an article by Stevens[1] of San Francisco, published six years ago. Previous to this time I had noticed practically nothing in literature in regard to this interesting condition. A survey of books on urology gave very little to enlighten my mind, and nearly all considered the condition a rarity.

Among the early contributors to our knowledge of this important phase was Lisfranc[2] who in 1824 described stricture of the female urethra. Then came Earle of London who gave us our first case report in 1828. In 1850 Civiale added to the literature, and was followed by Robert Newman in 1875, who emphasized the importance of this condition, and advocated electrolysis as the best treatment. Hermann of London found sixty-three cases in literature up to 1886, to which he added six from his own personal experience. Skene in 1887 called attention to the frequency with which he found stenosis in the female urethra and at that time stated that more serious consideration should be given this condition. Van der Warker in 1890 and Otis in 1892 added more to our knowledge of this lesion. Since Vilfoy in 1914 wrote on this subject, nothing has really been done in a systematic way until 1922, when Stevens made an exhaustive investigation and gave us a real scientific report. Since that time Wynne, Pugh and Hunner have given us articles that have increased our interest in obstructive lesions of the female urethra. Cheetham's recent article is concise and interesting, and his review of four cases of diversified etiology is evidence enough to show the necessity for examination of the urethra.

The incidence of stricture of the female urethra varies, but it is interesting to note the percentage as reported by different observers. In an article by Pugh[3] in 1926 he gives his percentage in 460 urologic examinations as over 20 per cent, while Stevens gives nearly 60 per cent out of 169 cases examined. Hunner[4] states that 85 per cent of his cases suffering with definite ureteral lesions have a strictured urethra. This incidence is noted undoubtedly for the reason that an investigation of upper urinary tract lesions entails the use of the cystoscope, the average caliber of the sheath being a 24 F. and any difficulty of introduction is more readily noted than in routine use of small catheters by nurses in hospital and office cases.

In Stevens' article, published in 1922, he reports that the majority of ureteral strictures are not complicated by stricture of the urethra, and he further states that "the most frequent complications are urethritis and trigonitis. One or both of these conditions were present in 83 per cent in a series of 114 cases, and pus was found in 85 per cent of the catheterized specimens of bladder urine." Cheetham[5] states that "10 to 20 per cent of all women complaining of urologic symptoms show definite evidence of varying degrees of ureteral stricture." In my own observation the incidence is about 25 per cent of all cases with urologic symptoms.

In a series of sixty cases which I have observed I find that 85 per cent are inflammatory in origin. Of these 70 per cent are gonorrheal in origin; 25 per cent mixed infection with B. coli predominating, and 5 per cent associated with syphilis.

Ten per cent of the series were traumatic in origin, with childbirth as a predominating cause. Two of these cases were from accidents, one of which had a laceration of the vulva with a tear into the meatus which was sutured, and a stricture at the meatus resulted. The other was in a young woman who had a fall, straddling a board fence with a resultant injury to the vulva and formation of a stricture at the meatus.

ETIOLOGY

In the perusal of the literature obtainable the causes of stricture of the female urethra are many and varied. Inflammations are given as the predominating cause. Under this heading gonorrheal infection heads the list, with focal, tuberculous and syphilitic infections adding their bit. The frequency with which one meets gonorrheal urethritis and vaginitis in private practice as well as in public clinics leads one to the conclusion that this causative factor is of the greatest importance. A search of case histories will give a surprising percentage, and yet we must realize that many will not willingly divulge a past infection if possible to conceal it. Stevens does not agree with Hunner that focal infection is a factor in stricture of the urethra, but I have classified one of my cases under this heading, since I believe the evidence sufficient to warrant it.

It might be well to note here the occurrence of a cicatrix from ulcerations due to the local application of strong caustics, particularly strong silver nitrate solutions. I have never seen a true gonor-

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rheal ulceration of the female urethra, but periurethral abscesses are not uncommon. Stöckel states that "deeply penetrating ulcerations of the mucous membrane with veritable loss of substance which cicatrize to form stricture do not occur in gonorrhea of women who have been properly treated or not treated at all, and he considers such ulcerations due, when found during or after gonorrhea, to improper treatment with caustics."

Trauma plays a very important role in stricture of the urethra, the result of childbirth, not so much a normal delivery as manipulation and instrumental interference. Strictures as sequelae of operations for cystocele or repair of urethrovaginal fistula are occasionally observed. Heinrichsdorff[7] reports a case of urethral stenosis due to urethrovaginal fistula of traumatic origin incurred during childbirth, in which the stenosis was sufficient to cause a backing up of excretions and dilatation of the upper urinary passages that terminated fatally. Few cases of congenital narrowing are mentioned in literature. Tumors of the urethra should not be called a causative factor. They produce obstruction but I do not consider that they alone cause a definite stricture. However, any operative procedure in the removal of these tumors, whether benign or malignant, may cause a stricture by formation of a cicatrix. A few cases may come under the heading of unknown causes.

PATHOLOGY

In considering the histology of the female urethra, the mucous membrane is of more importance than the subjacent tissues. Quoting Piersol,[8] "this is composed of a tunica propria, rich in elastic fibers, wandering cells and plexiform veins, and a layer of epithelium." The similarity of the female urethra to the membranous portion of the male urethra is striking. The epithelium at the meatus resembles that of the vestibule, while at the upper end is that of the bladder. The epithelium is stratified, squamous in type and in places it very nearly approaches the simple columnar. The glands in the urethra are small, tubular alveoli and open by minute ducts on the mucous surface or in small crypts, and are lined with columnar epithelium. They are more plentiful in the posterior third of the urethra, and correspond to Littre's glands in the male.

Stricture of the female urethra may well be classified as soft and dense. Wynnes'[9] classification as "traumatic, inflammatory, neoplastic, congenital, senile and unknown" is not practical. The classification according to the density of the stricture is the better, and is accepted by most writers.

The lesion begins as an acute narrowing of the floor of the urethra and often completely encircles it, producing the not infrequent annular stricture. The healing of ulcerations, etc., produce a contracting cicatrix at any part of the urethra. Most often the stricture is single but may be multiple. Since the predominating cause is inflammatory, the lesion is more often found in the anterior third than posteriorly. Remembering that strictures of traumatic origin are usually due to childbirth or the sequelae of operative procedure, it is then easy to conclude that the lesion may be anywhere along the canal. Strictures that are congenital may be at either end of the urethra.

SYMPTOMS

A careful history is of the utmost importance. The difficulty in obtaining a venereal history must be considered, but with the exercise of diplomacy even the better class of patients will answer questions truthfully. Inquiry in regard to childbirth, whether difficult or not, the presence of leucorrhea, the use of strong astringent douches, urethral treatments, or any pelvic operation are of the utmost importance.

Nearly all cases give a history of frequent micturition, and a large majority of these have either painful or burning micturition or terminal pain. In my opinion these symptoms are due to the varied type of associated inflammatory processes. I have observed a few cases that had difficulty in completely emptying the bladder, and on examination have found a severe trigonitis. Pain may be referred to the lumbar, sacral, bladder or inguinal regions. We must remember these subjective symptoms may also indicate upper urinary tract disease, and this calls for further urologic examination.

In 1923 Stanton[10] noticed this syndrome and reported a series of cases, in which he noted the relationship between the urethra and upper urinary tract through the sympathetic nervous system. Pugh[3] states, "the symptoms impressing me as of the most importance were dysuria, urgency and frequency."

DIAGNOSIS AND PROGNOSIS

The question now arises, what is considered a stricture of the female urethra? I believe that the average normal urethra in either male or female should take a 26 F. sound with comparative ease. In the routine examination of the male urethra, bougies and sounds are always used. Does the average general practitioner examine a female urethra in the same way? From histories taken I find the answer is, no. Even though a case has been catheterized, no thought is given to the difficulty of passing the instrument. I doubt whether many catheters over an 18 F. in size are ever used. In my opinion, the routine use of a 24 F. or larger catheter would demonstrate strictures in a large majority of cases with urologic symptoms.

In the examination of these cases the bulb bougie of Otis is of inestimable value. With it you can feel the characteristic pull or tug when the bulb comes up against the stricture posteriorly. The urethra is considered strictured if there is a definite hang to an 18 F. bougie. Gradations of the stricture are made with a sound, naming the stricture according to the size of the instrument used.

It is well for the general practitioner to familiarize himself with the use of the urethroscope as this is another valuable aid. The bladder should be emptied per catheter before any attempt at urethroscopy is made. The instrument should be introduced to the vesical neck and withdrawn slowly, and the lesions can readily be discerned. Instead of the mucosa falling away in its normal folds there is either a definite hang to the instrument or there is what I would call a tardy collapse of the canal. In annular strictures there is a definite, quick contracture just as the instrument is pulled through, and if pushed back slightly, the lesion can easily be observed.

A thorough bladder examination should be made to determine the extent of vesical involvement. This is easily done by the use of a nasopharyngoscope made by the Boehm Surgical Instrument Corporation. This instrument is invaluable and should be in the armamentarium of every physician. It is 13 F. in size, gives a very clear field, and is of course nonirritating. The latter is easily overcome by filling the bladder with water or boric solution per catheter and then inserting the lubricated instrument. In this manner the female bladder can be thoroughly examined with very little or no discomfort.

The prognosis is dependent on the type and gradation of the stricture. The soft stricture yields readily to treatment, while the hard is naturally more resistant.

TREATMENT

This is comparatively easy in the big majority of cases because of the predominating etiologic factor. After the use of the bulb bougie and the localization of the stricture, the urethroscope should be used and any existing urethritis cleared up. Upper tract infection should be treated in conjunction with the stricture.

The treatment of the stricture is dilatation. This may be accomplished by the use of graduated sounds or the Kollman dilator. The large majority of cases need slow dilatation. Very few cases need rapid dilatation, and if needed, some type of anesthesia should be used. I have found in 95 per cent of the cases coming under my observation that slow dilatation was sufficient. Beginning with a straight sound that just passes the stricture, the obstruction is dilated twice weekly until the Kollman dilator can be used, and then the caliber of the canal is dilated to 30 F., and occasionally to 35 F. If caution is observed there will not be any bleeding, and an increase of from 2 to 4 F. in the size of the sound will not cause discomfort.

Because of the frequency with which I have found a coexisting trigonitis, I routinely instill about 20 to 30 c.c. of either 5 per cent argyrol or 10 per cent neosilvol in the blader following the dilatation. This does not affect the stricture in any way, but in my opinion has a beneficial effect on any vesical inflammation, tuberculosis of course excluded.

A filiform stricture is rarely seen. Pugh reports one in a series of eighty-six cases, and advocates operative procedure which may include suprapubic cystotomy.

Internal urethrotomy is sometimes indicated in the denser infiltration. Occasionally external urethrotomy with complete dissection of the fibrous tissues is necessary. In Kelly and Burnam,[11] 1925, electrolysis is mentioned, but I believe this with a few other measures is obsolete.

The following cases are presented to demonstrate the efficiency of dilatation.

Case 1. Mrs. J. E. B., age 32, married twelve years. Has never been pregnant. Occupation, school teacher.

Past history: Hysterectomy for fibroids in 1920. Resection of twenty inches of small intestine for strangulation in 1923.

Present history began in 1922, with chronic bladder trouble. No examination of urologic tract made until April, 1927. A competent urologist then found a stricture of the urethra, chronic cystitis, stricture of the right ureter and an accompanying pyelitis. The stricture of the urethra was dilated to about a 26 F. and the upper urinary tract treated.

The patient then moved away about July 1, and had no treatment until I saw her on October 10. The stricture in both anterior and posterior third of the urethra was soft and tight for a 24 F. sound. Up to January 9, 1928, she had seven dilations, the last to a 35 F. with a Kollman dilator, and two catheterizations of right ureter, with an instillation of argyrol solution for an existing B. coli infection. On February 2 she was cystoscoped again and the bladder condition was nearly cleared up. A No. F. catheter was easily passed to the pelvis of the right kidney and culture from the urine was negative. Her bladder symptoms of frequency and urgency had disappeared, and she now states she feels well.

This case was undoubtedly due to both pelvic surgery and a urethritis associated with the cystitis and pyelitis.

Case 2. Mrs. M. L., age 23, married five years, never pregnant, occupation housewife. Came to me June, 1922, complaining of recurrent bladder pain with frequent and urgent urination, which began shortly after marriage. Apparently free from symptoms for as long as a year.

Bimanual vaginal examination revealed an apparently normal uterus and a tender, swollen left tube. A speculum revealed a chronic cervicitis. No gram negative diplococci found. Meatus was red and pouting. Examination of the urethra revealed a tight 18 F. stricture of anterior urethra, with evidence of a chronic urethritis. Chemical urinalysis was negative, microscopic examination showed numerous pus cells and B. coli.

Treatment consisted of urinary antiseptics; $AgNO_3$ to the cervix; weekly dilatation of the stricture, because the patient resided in the country; and instillation of 10 per cent argyrol in the bladder and urethra.

This patient was one of the first cases that I really studied and at this time received ten office treatments with considerable relief. On April 7, 1927, she returned and a careful examination of the canal showed a tight 22 F. stricture in the anterior third with a urethritis and a trigonitis. Evidence of a mild cervicitis found. Patient stated she had been taking strong potassium permanganate douches for a long time, because her left tube pained her at times.

The treatment instituted this time was weekly dilatation until a caliber of 35 F. was obtained, and the instillation of a 15 per cent neosilvol in the bladder and urethra. Advice in regard to salpingectomy not heeded.

In the case just cited I am of the firm opinion that the existing cause was the gonococcus, even though I have never been able to demonstrate this organism.

Case 3. Mrs. D. L., age 60, married, four children, normal deliveries, youngest child twenty years of age; occupation housewife.

Patient seen at home suffering from laceration of vulva with tear into urethra. History of falling on a small log with a sharp projection, while picking berries. Wound sutured and healing was normal. She was advised to appear occasionally for observation.

Patient was first seen six months after injury and a cicatricial contraction of the meatus found. No apparent discomfort that she could notice. A 16 F. sound was very tight. Biweekly dilatation over a period of two months brought the meatus to a 30 F. caliber with no discomfort or bleeding after the first two dilatations. This has been over three years ago and there is no evidence of a return.

This case is a definite illustration of stricture, caused by trauma, producing a cicatricial contraction.

Case 4. Mrs. F. M., age 32, married, two children, twins, difficult labor. Occupation, housewife. Past history negative except for thyroidectomy July, 1926, from which there was a complete recovery.

Present history of frequency, urgency and dysuria began a few months after the twins were born in 1920, and has continued more or less up to March, 1927, when she came under my care. Previous to this time she had had various internal medications for this condition with some relief at times. Her trouble now was severe enough to cause embarrassment so that she could not enter into social affairs.

A thorough urologic examination was made and the following was noted: Lateral tear of cervix; evidence of a repaired perineum; uterus and adnexia apparently normal; meatus normal; 18 F. bougie admitted, but would barely pass a stricture in anterior urethra. Patient complained of great pain when bougie was withdrawn. An 18 F. straight sound was then introduced, which was also painful without bleeding. The bladder was then examined with the nasopharyngoscope. There was a severe trigonitis present with a somewhat edematous vesical neck. The stricture was dilated and later when able to use a urethroscope the urethra was examined. The obstructing lesion was demonstrable on the floor of the anterior third of the urethra.

Treatment consisted of slow dilatation of the stricture to a 35 F. and instillation of a 10 per cent neosilvol solution in the bladder and urethra. Sixteen treatments were necessary to completely relieve the symptoms. Four months after the last treatment, the patient was reexamined and the Kollman dilator used again to a 35 F. with no discomfort.

I have classed this case as due to the trauma following a difficult labor.

Case 5. Mrs. L. R. L., age 22, married, no children, occupation housewife. Complained of marked frequency, urgency and dysuria for nearly a year. Repeated examinations of her urine revealed nothing.

She was given caprokol with some relief, but the condition recurred. Examination revealed a very tight 18 F. stricture of the anterior third with no upper tract disturbance. Biweekly dilatation with instillation of a 10 per cent neosilvol solution were applied for five weeks and symptoms disappeared entirely. This patient is now enjoying the best of health.

This case can be classified under unknown etiology.

Case 6. Referred by Dr. O. L. Adams. Mrs. M. E. F., age 60, widow, one child, normal delivery.

Past history: Surgery of uterine adnexa, type unknown, twenty years ago. Has had chronic ear trouble for fifty years that caused a mastoid, which was operated upon March 20, 1927.

Present history of chronic bladder trouble, indefinite, but patient states she has had it many years. Complains of frequency, urgency and dysuria.

Urologic examination revealed a fairly hard 16 F. stricture in the anterior third of the urethra. Examination of the bladder showed an associated chronic trigonitis. Urinalysis showed a trace of albumin with many pus cells, B. coli, staphylococci and some short chained streptococci.

Treatment consisted of biweekly, slow dilatation and instillation of ½ per cent mercurochrome in the bladder, together with urotropin by mouth. After twenty treatments the urethra could be dilated to a 32 F. with no discomfort or bleeding, and the patient was completely relieved. The urine showed a few pus cells and an occasional B. coli.

This case was undoubtedly helped a great deal by the radical mastoid operation and it is my belief that the chronic ear condition was the primary causative factor, so I have classified this as due to focal infection.

In conclusion let me emphasize the fact that stricture of the female urethra is not rare. A thorough urologic examination should be made on all cases with the three cardinal symptoms in mind, of frequency, urgency and dysuria. Elimination of the causative factor, if found, is necessary. Dilatation, supplemented with local treatment, is the one real method of relief.

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THE COLLINGS OPERATION *

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In the urinary tract obstructive lesions are probably as much a cause of morbidity as are infections. In fact, the obstruction causing stasis of urine is a predisposing factor of infection. Obstructive lesions at the bladder neck include hypertrophied prostate, median bar, and neoplasms, benign or malignant.

As early as 1830, G. J. Guthrie, lecturing before the Royal College of London, first described bar at the neck of the bladder, antedating the writings of the Frenchmen, Mercier in 1836, and Civiale in 1841, who are usually credited with the first publications on this subject. Guthrie described the impediment of the detrusor function by the loss of elasticity of the bar, and mentioned the residual urine augmented in consequence. He writes, "This bar, found at the neck of the bladder, has, I believe, been mistaken for an enlarged prostate; it has not, at all events, been considered as a separate disease." He even devised an instrument somewhat like an urethrotome for cutting this bar.

Two types of bars are recognized. The first was described by Guthrie as "an unnatural elevation of certain fibrous structures which underlie the mucous membrane at the posterior or vesical limit of the urethra, but which is unaccompanied by, and unconnected with any enlargement of the prostate." This type of bar is nonelastic and is probably caused by disease at the vesical neck, in many instances the infection of the mucous follicles by gonorrhea.

The second type of bar is an elevation and tightening of a fold of mucous membrane, with hypertrophy and spasticity, or both, of transverse muscle fibers, caused by the enlargement of the lateral lobes of the underlying prostate.

The enlarged median lobe, as part of the general hypertrophy of the prostate, is a condition that I only mention in order to exclude from consideration, as not falling within the scope of this paper.

We have, then, these two types of bar, one fibrous and tending to contract permanently the vesical neck; the other, capable of changing its tension from the maximum of dilatation under anesthesia to the extreme tightening at the time of straining to empty the bladder, thus creating the greatest obstruction to urinary outflow when there should be the least.

It is needless to describe the changes that follow. You are all familiar with the hypertrophy of the bladder wall due to increased connective tissue, the trabeculation and cupping one sees in these bladders, the reddened trigone and vesical neck, all caused by excess effort of the bladder to force out its contents. You have all noted the residual urine, increasing in amount and foulness; you have all heard the complaints of the patient as his day and night frequency increased, his urgency began to make him wet his clothing, and he became a nervous wreck from the constant irritation and interrupted sleep.

This picture includes the prostatic patient also. In fact, it is so classical that many a prostate has been enucleated and, of course, the patient cured, but in whom just as complete a cure might have been effected by an excision of the bar through the cystoscope, instead of subjecting the case to a major operation with its dangers, and weeks of offensive suprapubic dampness and delayed return of control of the bladder neck.

The prostate which on rectal palpation is not unduly pathologic as to texture, and whose lateral lobes are no larger than the distal phalanx of one's thumb, with no palpable median lobe, to my mind should never be removed until a cystoscopic examination has been made, for it is in this type of gland that the removal of an obstructing bar will cure the patient just as surely, and with infinitely less trouble than will the major operation. I have followed some of these glands through the pathologic laboratory and noted the small area of abnormal tissue at the vesical margin and wondered why it was necessary to remove a section of the urethra, veru montanum and all, and a gland that the pathologist could not classify as at all hyperplastic, when the lesser procedure would have served to remove

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* Read before the Thirty-ninth Annual Meeting of Washington State Medical Association, Seattle, Wash., Aug. 27-30, 1928.

the obstruction just as well, and with much less expense of time, money and suffering, and with no danger of death. Happily, our general surgeons are depending more regularly on the urologist for accurate diagnosis before subjecting the patient to unnecessary risks.

In 1915 Alexander Randall published a most exhaustive review on this subject and pointed out that the symptoms of prostatic enlargement and of median bar were identical, because they arose, not *from* these two conditious but *because* of them interfering with the normal function of the bladder and urethra.

Instruments for resection of the vesical neck are not a modern novelty. I remember in 1897 seeing the Bottini instrument, a water-cooled electrocautery with a curved beak, introduced into the bladder and then turned over so the blade could be held against the lower segment of the vesical orifice, while the current was turned on to bring the blade to a white heat, and so make one or more cautery incisions of the obstruction.

Later we had Geraghty's sphincterotome for cutting a contracture without cauterization. The development of the tubular punch instrument, and its evolution into a cautery punch by Young, Braasch, Caulk and others, is too recent to need description here. In 1913, fulguration was used to destroy a bar in several sittings by A. R. Stevens, of New York. Two years ago Maximillian Stern brought out his invention, the resectoscope, an apparatus capable of slicing out sections of the vesical neck by means of a diathermy loop under direct vision. The objections to this instrument are, first, the shallowness of the cut; and, second, the high cost of the apparatus, being priced at one thousand dollars. This was followed by Colling's publication of his diathermy knife method, the electrotome, the subject of this paper.

The Collings apparatus consists of a McCarthy panendoscope, a Collings diathermy knife, and the special type of diathermy machine for generating a very high frequency current. Through the panendoscope it is a simple matter to excise a bar by making incisions at 5 and 7 o'clock and taking out the intervening wedge. Collings has recently modified the panendoscope by adding a pipe to carry a constant stream of water directly to the field of operation, to increase clarity of vision. My instrument lacks this innovation, but by having the bladder empty at the beginning of the operation, and allowing a stream to flow in while the cutting is done, I have managed to keep the field quite clear.

The technic is simplicity itself for any operator accustomed to working through the panendoscope. One maxim only I wish to stress, namely, to cut deep enough. To insure success the primary incision should be from one to one and one-half centimeters deep. As the blade of the diathermy knife is one centimeter long, it is hardly possible to cut too deep. All the cutting is done posteriorly to the veru montanum, and a good test of the completed operation is to withdraw the cystoscope slightly, and be able to see from the veru to the trigone in a straight line.

After the resection is done, an indwelling catheter is allowed to stay in for two days, and the patient is then allowed to leave the hospital. Twenty days later he is discharged from further observation. I have tied off the vasa preoperatively, and have had no epididymitis so far. These ligatures, done through the skin, are removed in twenty days.

The disadvantages of any cutting operation through the cystoscope are bleeding and pain. Some of the earlier operators followed the cutting with fulguration to control hemorrhage, and this naturally led to doing the cutting with the cautery or diathermy. The only advantage of cutting with the steel instrument is the opportunity for biopsy of the fragments removed. The diathermy avoids immediate hemorrhage, and with the Collings instrument even the secondary hemorrhage so often seen after the cautery operation is avoided, due to the type of current used which cuts without a deep eschar, so the subsequent slough is superficial and bleeding is rarely sufficient to tinge the urine.

With this knife the operator makes his incisions easily, takes out as much or as little tissue as the individual case requires. He has his field of operation under direct vision, an injection of procain in the sacral canal giving complete comfort to the patient. The postoperative hospitalization is only a couple of days, and there has been no mortality, thus making almost a minor operation out of what, with prostatectomy, is always a major.

In my series of cases done by this method all had marked trabeculation, nocturia and residual urine. Other symptoms noted were frequency, urgency, burning, difficulty in starting, small dribbling stream and incontinence. Nearly all had decreased renal function and pyuria. The ages ranged from sixty to seventy years. Time in hospital, two to four days; no epididymitis, most of these cases having the vasa ligated previous to resection.

Results were 37 per cent definitely cured, all symptoms having disappeared, patients being checked up from four to seven months after operation. Twenty-four per cent showed marked improvement when seen four to six weeks after operation. One might reasonably expect that, if checked after a longer lapse of time, these cases could also be classified as cured. Twelve per cent showed improvement, but all symptoms had not cleared up when last heard from, thirty to sixty days postoperative. Twenty-seven per cent could not be followed, due to change of address, etc.

Recapitulating these results, then, gives us, of the 73 per cent followed after operation 61 per cent definitely cured or sufficiently improved to warrant expectation of cure, and the remaining 12 per cent improved.

These patients are all old men, mostly with degenerative renal and cardiac lesions and hypertension, poor surgical risks as a rule, who are better off if not confined to bed unduly, all of which makes one inclined to welcome a minor operation in their treatment, with a few days of hospitalization rather than the major procedure, fraught with greater danger both at operation and afterward.

In conclusion, I wish to add that this paper is not intended as a complete study of this subject, but merely as a suggestive progress note, in the hope of fixing the urologic surgeon's attention on this operation, to the end that patients with bladder neck obstruction may be more carefully studied, that some of them, at least, may be cured with the cystoscopic operation rather than prostatectomy.

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A COMPARISON OF THE WASSERMANN AND PRECIPITATION REACTIONS IN PREGNANCY

WITH A REPORT OF ONE HUNDRED SIGMA AND FOUR HUNDRED HINTON TESTS*

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It is a fairly well known fact that the Wassermann reaction cannot be relied upon for a diagnosis of syphilis in the pregnant woman with the same degree of assurance as in others. De Lee[1] considers it absolutely unreliable, often giving false positives. Belding[2] also considers it unreliable. If he gets a strongly positive reaction with the cholesterolized antigen, he administers treatment to the mother, otherwise he gives no antiluetic treatment. Nathanson[3], however, thinks that a routine Wassermann is a valuable diagnostic procedure, and that a positive reaction is decisive evidence of syphilis in the mother.

In the prenatal clinic of the Providence Lying-in Hospital, blood has been taken for a routine Wassermann test for several years. In 1926 twelve positives were obtained in 827 patients, and in 1927 nine positives in 838 patients, an incidence of 1.45 per cent and 1.07 per cent respectively. Considering this a rather low incidence of positive reactions for a public clinic, we decided to compare the Wassermann reaction of the blood with some other reaction.

Accordingly, we took specimens of blood routinely from five hundred women in various stages of pregnancy who attended the prenatal clinic for the first time during a period of six months. In the first hundred of these a comparison was made between the Wassermann (both acetone and cholesterolized antigens) and the Sigma reaction.

The Sigma is a quantitative serum reaction advocated by Dreyer and Ward[4]. It is a flocculation test, using two standardized saline suspensions of different concentrations made from a mixture of alcoholic extract of heart muscle and cholesterin. The results are expressed in terms of standard units, called Sigma units. Dreyer and Ward claim that it compares more than favorably with the Wassermann reaction, is a quantitative test which can be standardized, and that one can follow changes in a case under treatment and compare accurately the relative merits of different methods of treatment with this reaction.

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* From the Providence Lying-in Hospital and the Providence City Hospital Laboratories, Providence, R. I.

CASE No.	WASSERMANN		SIGMA	HINTON	REMARKS
	ACETONE	CHOLEST			
35	+	++	0		Considered negative
Repeat	—	—	0		
42	+	++++	14		Positive, agree.
51	—	—	106		Positive, not agree.
58	—	+	0		Negative
79	+	++++	22.72		Positive, agree.
99	—	+	2.19		Doubtful negative
104	+	++++	16.32	Pos.	Positive, agree.
116	+++	++++		Pos.	Positive, agree.
151	++++	++++	43.52	Pos.	Positive, agree.
160	—	+	0	Neg.	Negative
182	—	—	0	Pos.	No history or sym.
Repeat	—	—	1.06	Pos.	Consid. neg. Not agree.
188	++++	++++	326.4	Pos.	C. S. Syphilis. Positive
215	—	+	0	Neg.	Negative
Repeat	—	+		Neg.	
253	+	++++	28.3	Pos.	Positive, agree.
264	++++	++++		Pos.	Positive, agree.
266	—	++	0	Neg.	Negative
267	—	+		Pos.	Positive, not agree.
293	—	+		Neg.	Negative
404	—	+		Neg.	Negative
413	—	+	1.06	Neg.	Negative
453	++	++++		Pos.	Positive, agree.
483	—	—	3.79	Pos.	Treated case; positive do not agree.

Cases in which the Wassermann and precipitation reactions were positive or did not agree.

With the other four hundred specimens, a comparison of the Wassermann and Hinton reactions was made. This latter is a glycerol precipitation reaction advocated by Hinton[5]. He has compared it with the Wassermann in a large number of cases. In 195 specimens from pregnant women without clinical evidence of syphilis there was not a single positive reaction. He concludes that the test is more delicate and presumably more reliable, and requires less labor to carry out than the Wassermann.

In our series of one hundred Wassermann and Sigma reactions there were 94 agreeing as negative, and two agreeing as positive. There was one in which the Wassermann was negative and the Sigma quite strongly positive. From the history and the physical signs of the baby later, this was considered a case of syphilis. There was one where the Wassermann was doubtful in the cholesterolized antigen and the Sigma was weakly positive. As there were no physical signs or a history of lues, this was considered negative. In two cases the Wassermann was doubtful and the Sigma negative. Both were considered negative, and in one of these the Wassermann later proved to be negative.

In the four hundred Wassermann and Hinton reactions, there were three hundred eighty-four agreeing as negative, and seven agreeing as positive. There were three in which the Wassermann was negative and the Hinton positive; one was a treated case of syphilis; another was considered positive from the history and physical signs. The third was a patient who gave no history or symptoms of syphilis. Her incisors were notched, resembling Hutchinson's teeth, but her mother and father were both well and past fifty years of age, and there were four other children in her mother's family all well and healthy. She has four normal children all living and well, but has had two miscarriages at the second month, cause unknown. Her husband gives no history or symptoms of lues. Her blood was strongly positive to the Hinton on two occasions and negative to the Wassermann. The Sigma gave a negative once and a very weakly positive again. Taking all of these facts into consideration, she was thought not to have syphilis, and received no treatment. At this writing she is near term with an apparently normal fetus.

There were six specimens that gave a weakly positive Wassermann and a negative Hinton. All of these were considered negative.

This gives us twelve positive reactions in five hundred cases or an incidence of 2.4 per cent, approximately what other investigators have found in prenatal clinics where the large majority of patients are white women.

All of the positive or questionable results are shown in the accompanying table.

CONCLUSIONS

1. We consider a routine blood Wassermann test on prenatal patients of definite value in the diagnosis of syphilis.
2. If this be checked by a precipitation reaction, the value is increased.
3. The best precipitation reaction for this purpose in our estimation is the Hinton test.

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NORTHWEST MEDICINE

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EDITORIAL

ANEMIA, FOOD AND IRON

Six years ago in an editorial[1] in NORTHWEST MEDICINE the subcutaneous use of iron was decried, because iron acts more effectively when given by mouth in food and because many pale people to whom it is given are not anemic at all when tested for hemoglobin. In closing we said: "The routine treatment of pale people by hypodermatic injections of iron is a modern instance of 'brass' acting on iron to produce gold—a veritable alchemy."

We feel again impelled to call attention to this form of iron therapy because it is still practiced by many physicians notwithstanding its condemnation by high authorities. Since the appearance of our first editorial Dr. Christian, at a meeting in Spokane, was asked what he thought of the use of iron subcutaneously. He replied that he had never considered it desirable and ended by saying it was a form of bunk. As recently as last June an editorial in the *Journal of the American Medical Association* stated that "The administration of iron subcutaneously or intravenously is rarely necessary or desirable. Iron is normally found in the food and minute amounts only are required." As a fact about one-twelfth to one-sixth of a grain is absorbed daily from the food.

Within the past five years enormous additions to our knowledge of anemia and its treatment have been attained through the labors of Whipple, Hooper, Robscheit Robbins, Elden and Sperry, Minot, Murphy and Cohn, Gibson and Howard, Peabody and Doan, Koessler and Maurer, Hart and Steenbock, Berglund, Mason and others. The brilliant, fundamental and epoch-making investigations of Whipple and his associates have added more than any others to our general knowledge of anemia and formed the basis for the miraculous work of Minot, Murphy and Cohn in the treatment of pernicious anemia. Whipple and his coworkers have produced a simple or secondary anemia in dogs by weekly bleedings over many years and have tested the effect of various foods and drugs in bettering this anemia or, in other words, in blood hemoglobin regeneration. Whipple finds foods much more important than inorganic agents for this purpose and divides food into three groups. The least effective for hemoglobin regeneration is group (1) cereals, many vegetables, certain fruits, all fish and dairy products. (2) The middle group, having more favorable hemoglobin making properties, embraces some leafy vegetables (spinach, lettuce), beef, pork, veal, pancreas, brains, peaches, prunes, apricots and raisins. (3) In the most potent group liver (beef, calf, pig, sheep or chicken) stands at the top, while chicken gizzard and kidneys of all animals are of equal value.

In secondary anemia, alcoholic and watery extracts of liver are only one-third the worth of liver but, combined with some liver feeding, are equal to full feeding of liver. Whipple finds iron of little use in anemia of short duration. In long standing severe secondary anemia it is of considerable value, but less by half than liver feeding. The optimum effect was secured in simple anemia by liver feeding plus iron. In two weeks on high liver feeding there was a hemoglobin formation of 100 grams. By the addition of iron this was increased to 140 grams. The citrate of iron appears to surpass all the other salts in value.

The fact that kidney feeding is on a par with liver feeding in anemia is most suggestive. The kidneys conserve materials useful for building hemoglobin and in damage to the kidneys as in nephritis, anemia is almost a concomitant. This may be due to a lowering of the threshold of hemoglobin conservation materials allowing them to escape. Whipple[2] believes that many more anemias are due to insufficient diet than is generally appreciated. For instance, the simple anemias of children commonly follow too great feeding with dairy products included in the group least favorable for hemoglobin formation. The astonishing effect of peaches and apricots in anemia suggests their use in a low proteid diet of nephritis. Even the anemia of cancer Whipple thinks may yield surprisingly good results with proper diet.

Pernicious anemia appears to Whipple to be without doubt a dietary anemia or deficiency disease instead of the result of intestinal intoxication as often thought and taught. The bone marrow abnormalities described by Peabody and Doan clear up rapidly on a liver diet and the experience of several years seems to show that pernicious anemia is permanently cured by adhering more or less to the liver diet. The upshot of the whole matter is that diet is of much more importance than drugs in primary and secondary anemia, and the remarkable researches of Whipple and his coadjutors extending now over many years have yielded the most valuable practical results in therapy since the discovery of salvarsan. All practitioners should make themselves familiar with this work.

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[2] Whipple: J. A. M. A., Sept. 22, 1928.

K. W.

THE AMERICAN COLLEGE OF SURGEONS BOSTON MEETING

The annual clinics and meetings of the American College of Surgeons, held in Boston October 8-12 inclusive, proved to be the greatest meeting of the College. The attendance was over twenty-five hundred. The clinical facilities in Boston are so well organized that no difficulty was experienced in attending any of the clinics with the exception of the Eye and Ear section. The Massachusetts Eye and Ear Infirmary and Harvard Medical School both held excellent clinics, but the attendance was too great for the size of the rooms.

The "dry clinic" idea was developed to a greater extent than at any previous meeting. There were special clinics on traumatic and industrial surgery, arranged by the American Mutual Liability Insurance Company. These were held daily and covered every type of injury. The Massachusetts State Department of Labor and Industries assisted in these clinics. The week before the meeting an intensive fracture course was given at Harvard Medical School under the committee on fractures of the American College of Surgeons. In addition, there were fracture clinics at the other leading hospitals, showing methods and end results.

Conferences were held on thromboangiitis, orthopedics, genitourinary surgery, gynecologic surgery and traumatic surgery.

Scientific papers were presented by the foreign guests of honor at the evening meetings as follows: (1) The John B. Murphy Memorial Oration on Surgery on "Malignant Bone Tumors," by Prof. Vittonio Putti, Bologna, Italy. (2) Hunterian Oration on "Graced Curiosity," by Sir Squire Spriggs, London, England. (3) "Cordoma of Spine," by Archibald Young, Glasgow, Scotland. (4) "Some Thoughts on the Nature of Cancer," by Sir Charles Ballance, London, England. (5) "Comments and Motion Pictures on Orthopedic Surgery," by Colonel Sir John Lynn Thomas, Llechryd, Wales.

A cancer symposium and a meeting of the Boston Surgical Society at which time the presentation of the Henry Jacob Bigelow medal to Chevalier Jackson of Philadelphia were both exceptional meetings.

Hospital standardization was given its usual four day intensive discussion. Each year this department has increased until this year it had to be divided and at times two conferences were being held at the same hour.

The outstanding features this year were probably the development of dry clinics and demonstrations, industrial surgery and the treatment of fractures, the development of electrosurgical units to replace the scalpal and hemostat in surgery, the Crile theory of the cause of hyperthyroidism, advancement in bronchoscopy, new ideas regarding the etiology and treatment of cancer, surgical motion pictures.

The inaugural address was given on the opening day by Dr. Franklin Martin, president of the College. On the last evening six hundred new Fellows were given certificates in a most impressive ceremony at Symphony Hall. Dr. Martin reviewed the history of the founding of the College and spoke of the struggles and final successes and of the ideals which govern the Fellows. He called attention to the fact that the "old guard" of Fellows who founded the College are rapidly being replaced with the "new guard" of Fellows who have no other motives than to carry forward the ideals of the founders. Dr. William Mayo gave some interesting advice to the new Fellows and touched briefly upon the new surgeon, the young man who specializes in surgery from the beginning. His oration was most complete in that it was an epitome of final conclusions reached after forty years of active surgical study and practice.

The annual meeting of the Fellows was well attended. Sir George A. Syme of Malvern, Australia, President of the College of Surgeons of Australia, described that organization.

Surgeon General Ireland of the United States Army was elected President-elect for the next year. Dr. Ernest A. Sommers of Portland, Oregon, was elected to fill the vacancy in the Board of Regents for the Northwest district due to the death of Dr. James B. Eagleson.

The attendance from the Northwest was not up to the usual number, probably due to the fact that the distance is so great. The meeting next year will be at Chicago about October 14-19.

The annual meeting of the "Gorgas Memorial Foundation" was held at the Statler Hotel October 10. Dr. Franklin Martin, who has been president for the past several years, was elected chairman of the Executive Committee, while Admiral Cary T. Grayson was elected to succeed Dr. Martin. The headquarters of the Foundation will be moved to Washington, D. C.

Mr. Robert O. Jones, formerly of the Public Health League of Washington, who has been directing the publicity campaign of the Foundation the past year, was present and outlined the work for the next year.

Admiral Grayson brings to the Foundation an enthusiasm of purpose founded upon an intimate knowledge of the life of General Gorgas. A wide circle of his acquaintances among those who are interested in the Foundation includes many senators, congressmen, members of Washington's official life, and hosts of friends among the ever-changing foreign colony. His years of close association with officials in all government activities has given him a poise of tact and culture that fits him admirably for the position of head of one of our great medical foundations. He intends to visit the various centers during the next year, and his charming southern personality will bring to him hosts of new and admiring friends wherever he may go. He has promised a visit to the Northwest in March of next year.

THE PHYSICAL THERAPY MEETING

Last month in Chicago the annual meeting of the American College of Physical Therapy was attended by more than seven hundred physicians from all sections of the country. Interest in the work represented by this organization was attested by the program which listed over a hundred papers on various phases of physical therapy, arranged in three sections, scheduled for the daily sessions over a five day period. The Hotel Stevens, said to be the largest hostelry in the country, provided adequate, quiet assembly rooms on one floor, suitable for each session. The active interest in this line of therapeutic effort was indicated by the large attentive audiences that greeted each speaker, even to the end of the program.

A conspicuous feature, observed throughout the meeting, was the repeated emphasis on the necessity of accurate diagnosis, constantly stressed by the essayists. Haphazard, aimless treatment sometimes practiced was vigorously condemned. In order to apply physical therapy intelligently one must know pathology and be capable of visualizing the diseased condition under consideration. He must have accurate knowledge of the physical effects of every agency that he employs and this cannot be obtained from the manufacturer's agent which has too often been the basis of a physician's physical therapy education. This leads to the requirement, which received much attention, that one should thoroughly familiarize himself with all phases of physical therapy, as of any other specialty, before administering to patients. The mere possession of an apparatus and its ignorant application, without knowledge of its construction and suitable uses, is reprehensible and should not be tolerated.

While many therapeutic methods received much consideration, one was impressed by special attention given certain procedures. The galvanic was the first electric current employed extensively in medicine. Of recent years, however, it has been eclipsed in popular favor by the newer forms of currents, especially the varied sinusoidal modifications, so that its manifold usefulness has been neglected. At this meeting it was featured by several essayists. Much importance was assigned to galvanic ionization, by which certain drugs can be driven into the tissues with consequent therapeutic results. Interest in this subject was enhanced by the presence of Dr. A. R. Friel of London, described as the "father of zinc ionization," who has had a leading part in the discovery and perfection of this form of therapy. He appeared four times on the program and added much to the general knowledge of this subject. Farther developments along this line were predicted. Although other electric currents were discussed extensively, a striking omission was noted in totally ignoring the static current. Not alone did it fail to appear as the topic of a paper on the program, but it was scarcely mentioned by name in any discussion. This was difficult of comprehension by one familiar with this most useful agency and its unequalled roll as a decongester. Any physical therapist who has observed its incomparable results will be unable thereafter to practice without it.

A number of papers presented the advantages of electrocoagulation of tonsils. In fact, a morning of one section was devoted to this subject. The successful results and freedom from complications, when this method is properly executed, were witnessed by the testimony of numerous operators. It was evident that the popularity of this procedure is gaining the adherence of an increasing number of operators. The usefulness of ultraviolet light as a therapeutic agency was obvious from the number of papers dealing with this subject. While ultraviolet rays have been most commonly developed from the mercury arc in the quartz tube, the carbon arc lamp has of late received much attention. Both were discussed in papers before the meeting. Interest in this subject was emphasized by the presence of Professor Carl Sonne of Copenhagen, who is in charge of Finsen Institute in that city. He delivered five addresses, dealing with various phases of ultraviolet rays. He is an authority on light therapy, having been identified for many years with its employment at the Copenhagen institution. Everyone in attendance at this meeting recognized it as a valuable opportunity for the acquistion of knowledge in the progressing field of physical therapy.

MEDICAL NOTES

OREGON

Oregon Alumni Elect Officers. At the annual meeting of the alumni association of the University of Oregon medical school, which took place last month in conjunction with the Oregon State Medical Society convention at Portland, Dr. Richard P. Landis of Portland was chosen president for the ensuing year. Dr. Claude A. Lewis of Portland was made secretary.

National Secretary Visits Portland. Dr. Olin P. West of Chicago, Ill., secretary-manager of the American Medical Association, spent several days in Portland early in October, the purpose of his visit being to confer with the local committee in charge of the 1928 convention of the association, which is to take place in Portland July 8-13.

Open Health Resort. The Hubbard Mineral Springs Sanatorium, which has been closed for several months during the carrying out of extensive improvements, was formally reopened to the public Sept. 30. The improvements include a new addition to the main building and a new bath house. The sanatorium will be in charge of Dr. Richard Landis and Dr. H. Peterson, formerly of Portland.

Convict Illegal Practitioner. Albert C. Burroughs was convicted September 18 on a charge of practicing medicine in Portland without a license and was fined two hundred and fifty dollars by Circuit Judge Ekwall. According to Mr. C. W. Kirk, deputy in the state department of licenses, Burroughs' conviction is the twenty-third which his department has secured in the course of a clean up of unlicensed physicians during the past seven months.

Appointed to Hospital Staff. Dr. Ben N. Wade and Dr. E. W. St. Pierre, both of Portland, have been appointed attending surgeons to the Multnomah County Hospital.

Lane County Medical Society held a joint meeting with the Central Willamette medical society at the Osburn Hotel in Eugene September 27. Dr. C. F. Gelston, San Francisco, Calif., associate professor of pediatrics at the University of California medical school, delivered an address on "Diseases of the Respiratory Tract in Children." Dr. Jay R. Coffey of Portland spoke on goiter.

Elect Hospital Officers. At a meeting of the staff of St. Mary's hospital at Astoria, which took place Oct. 10, Drs. M. H. Smith, F. M. Spalding and F. H. Vincil were chosen to represent the physicians of Astoria on the hospital board of control. Dr. H. B. Holden of Portland was a guest of the staff and made an address on "Intestinal Obstruction."

Dr. H. P. Oakes of Gresham was struck by an automobile Oct. 11 as he was crossing one of the downtown streets of Portland. At the St. Vincents hospital, to which the injured physician was removed, it was found that he had sustained a fracture of the left hip.

Dr. H. N. Whitelaw has opened an office at Corvallis.

WASHINGTON

Orthopodist to Lecture. Considerable interest has been aroused by the announcement that Dr. Melvin S. Henderson, chief of the orthopedic section of the Mayo Clinic, Rochester, Minn., will be the guest of the Seattle Orthopedic Society on Dec. 14 and 15. He will hold several clinics and read a paper at the annual banquet. Dr. Henderson has been chief of the orthopedic section at the Mayo Clinic for twenty years and is known all over the world for his contributions to the subject of bone surgery.

To Improve Veteran's Hospital. Bids were to be opened at Washington, D. C., Oct. 16 for the addition of a new infirmary at United States Veterans' Hospital No. 85 in Walla Walla. The new structure, which will cost $250,000, is expected to replace several old landmarks, which are now serving to house the institution.

Open New Maternity Unit. The obstetrical department and nursery at the Deaconess Hospital, Spokane, which have been thoroughly reorganized to conform to the latest practice in large institutions in the East, were formally dedicated to the public at exercises held at the hospital Oct. 11.

Seattle Pediatric Society held its first autumn meeting of the year Oct. 19 at the College Club. Dr. Arthur H. Gray was chosen president for the ensuing year. Dr. Armin Rembe was elected secretary-treasurer.

The program was limited to a discussion of anterior poliomyelitis. Dr. Jay I. Durand spoke on diagnosis and treatment of the acute stage of the disease, while Dr. H. J. Wyckoff described the orthopedic after-care.

Spokane County Medical Society met at the Spokane City Club in Spokane Oct. 11. Dr. J. Tate Mason of Seattle gave an illustrated lecture on a number of points in surgical technic. Dr. George A. Dowling, also of Seattle, read a paper on the subject of "Diseases of the Gallbladder."

Snohomish County Medical Society held its regular meeting Oct. 2 in the library of the Medical and

Dental Building. Dr. Torlief Torland of Seattle gave an illustrated lecture on "The Diagnosis of Pelvic Conditions Aided by the Use of Lipiodol." Dr. H. H. Kretzler of Edmonds presented an autopsy specimen of coronary thrombosis.

Dr. E. A. Stafford of Snohomish called the attention of members of the society to a patient who has made a practice of victimizing physicians in his locality with bad checks.

Walla Walla Valley Medical Society held the first meeting of the season at St. Mary's Hospital, Walla Walla, Oct. 11. The following officers of the society were elected for the ensuing year: President, Dr. J. T. Rooks; vice-president, Dr. R. E. Golden; secretary, Dr. C. J. Johannesson; treasurer, Dr. J. E. Vanderpool; advisory board members, Drs. H. R. Keylor, A. E. Lange and E. J. Rhoades.

Whitman County Medical Society held its first autumn meeting at Colfax September 25. Dr. Lester J. Palmer of Seattle addressed the society on the treatment of diabetes and its complications. Dr. H. P. Marshall of Spokane spoke on public health problems.

Physicians in Auto Crash. Dr. R. W. McKinley and Dr. E. M. Jones of Burlington, while riding as passengers in an automobile being driven toward the interurban railroad tracks on the evening of September 19, were injured when the car ran into the side of a freight train. Dr. McKinley was severely cut by flying glass, while Dr. Jones suffered fracture of two ribs.

IDAHO

Veterans' Physician Transferred. Dr. Clyde T. Smith, assistant medical officer and clinic director of the United States Veterans' Hospital at Boise, has been transferred to the new Veterans' Hospital at Portland, Ore. His place has been filled by Dr. Charles L. Magruder.

OBITUARIES

Dr. Chesney L. Dutton, Eugene, Ore., died at his home Oct. 16, aged 54 years. He was born in 1874 and graduated from the University of Colorado School of Medicine, Denver, Colo., in 1901. He practiced for several years in Meridian, Idaho, later moving to Boise, Idaho, where he remained for twenty-three years. In 1926 he settled at Eugene. His father, Dr. S. W. Dutton of McCracken, Kansas, survives him.

Dr. George Salwin Allison, Santa Monica, Calif., died at his home Oct. 18, aged 81 years. He was born in 1848, and graduated from Washington University, Medical Department, in 1871 and from Bellevue Hospital Medical College, New York, in 1881. He was one of the pioneer physicians of Spokane, Wash., where he practiced from 1882 until his retirement in 1916. He was a charter member of the Spokane County Medical Society when it was organized in 1884.

Dr. Thomas W. Kirby, Portland, Ore., died at the Good Samaritan Hospital at Portland Oct. 16, aged 61 years. He was born at Maple, Ontario, in 1867, and graduated from Trinity Medical College, Toronto, in 1895. Later he spent several years in study abroad. After practicing several years in Sault St. Marie, Mich., he moved to Portland, where he practiced until the time of his death.

Dr. William Charles Wilson, Tacoma, Wash., died suddenly at his home September 21, aged 46 years. He was born in 1882 and graduated from Northwestern University medical school in 1907. He practiced for several years in Polk County, Minn., where he served as city and county health officer. He was a veteran officer of the World War.

Dr. George J. Hill, Hollywood, Calif., died at the home of his mother on or about Oct. 1. He was the son of a pioneer woman physician of the Northwest, Dr. Owens Adair. He followed his mother's profession, graduating from the University of Oregon Medical School, Portland, Ore., in 1877. He entered the practice of medicine at Goldendale, and later moved with the pioneers who settled the town of Yakima. He was active in politics and community affairs. He retired several years ago to his mother's home in Oregon.

Dr. Louis A. Shane, Portland, Ore., died at his home October 1, aged 53 years. He was born in 1875, and graduated from the University of Oregon Medical School, Portland, Ore., in 1900. He occupied the position of instructor in the medical school, later engaging in general practice.

Dr. Frank Chappell, Granite Falls, Wash., was found dead at his home Oct. 2. He was born in 1847 and graduated from the University of Michigan Medical School, Ann Arbor, Mich., in 1881. He had practiced in Granite Falls for the past thirty-five years.

Dr. J. L. Marbourg, Seattle, Wash., died at his home October 5, aged 68 years. He was born at Johnstown, Pa., in 1860, and graduated from Jefferson Medical College, Philadelphia, Pa., in 1888. He served two years as physician to the Marine Hospital at Port Townsend, and also was engaged in practice at Port Gamble.

Dr. Milo Kirkpatrick, Portland, Ore., died at his home on October 23, aged 72 years. He was born in 1856 and graduated from Rush Medical College, Chicago, Ill., in 1885. He settled in Portland thirty years ago, and practiced the specialty of diseases of the eye, ear, nose and throat in that city, until 1923 when he was forced by ill health to retire.

Dr. Henry D. Lloyd Stewart, Klamath Falls, Ore., died at his home on October 24 as the result of injuries due to the accidental discharge of a revolver. He was born in 1891 and graduated from the Chicago College of Medicine and Surgery, Chicago, Ill., in 1915. Soon after graduation he located in Klamath Falls, where he practiced continuously until the time of his death.

REPORTS OF SOCIETY MEETINGS

OREGON STATE MEDICAL SOCIETY

MINUTES OF THE FIFTY-FOURTH ANNUAL MEETING OF OREGON STATE MEDICAL SOCIETY, HELD AT HOTEL MULTNOMAH, PORTLAND, ORE., SEPTEMBER 20-22, 1928.

HOUSE OF DELEGATES

FIRST SESSION

Friday, Sept. 21

The opening session of the House of Delegates was called to order by President Hugh S. Mount, at 7:30 a.m. in Room 101 of the Hotel Multnomah.

On roll call, the following officers and councilors were present: Hugh S. Mount, L. B. Bouvy, John W. Sifton, Clarence W. Keene, Frederick D. Stricker, J. Earl Else, Joseph A. Pettit, William Kuykendall, Charles E. Sears, C. L. Booth, Frank R. Mount, H. J. Clements, Wilson Johnston, W. P. McAdory, and the executive secretary.

The following delegates were present: E. L. Zimmerman of Eugene, Central Willamette District Medical Society; Thomas J. Higgins of Baker, Eastern Oregon District Medical Society; W. W. Baum of Salem, Polk-Yamhill-Marion Counties Medical Society; Alvin W. Baird, Frank Boyden, Stanley Lamb, S. H. Sheldon, E. A. Sommer, and C. H. Manlove of Portland, and John H. Rankin of Newberg, Portland City and County Medical Society; David Robinson of Tillamook, Tillamook County Medical Society.

The following committee members were present: Robert C. Coffey, A. G. Bettman, John H. Fitzgibbon, and H. M. Greene, all of Portland.

The following officers of component societies were present: Charles E. Hunt of Eugene, Secretary of the Central Willamette District Medical Society.

Upon motion duly made and seconded, it was voted to dispense with the reading of the minutes of the last meeting, the minutes having been printed in the December 1927 number of NORTHWEST MEDICINE.

Communications

The following letter from the President of the Women's Auxiliary to the Oregon State Medical Society was read:

To the House of Delegates of the Oregon State Medical Society:

At the request of the Women's Auxiliary to the American Medical Association, the trustees of the American Medical Association appointed a Liaison Committee from their own body to serve as an Advisory Council to the Auxiliary. This has been found indispensable to the co-ordination of the work of the Auxiliary with that of the American Medical Association.

The Woman's Auxiliary to the Oregon State Medical Society feels the need of such a committee, and respectfully requests the House of Delegates to create such a standing committee, consisting preferably of three members appointed from the Council in order that there may always be a close relationship between the Auxiliary and the body serving as the Executive Committee of the Oregon State Medical Society.

Respectfully,
(Signed) Mrs. J. Earl Else,
President of the Woman's Auxiliary to the Oregon State Medical Society.

Upon motion duly made and seconded, it was voted that the President should appoint the liaison committee requested in this letter, the members to be selected from the Council.

Report of the Secretary

Dr. Frederick D. Stricker, Secretary, made the following report:

The growth and increased activity of the Society during the past few years, under our full-time program, has been the source of much favorable comment among our members. We now have the largest membership in our history with a total of five hundred seventy-two members. It is especially noteworthy that most of the young men are affiliating with the Society almost as soon as they enter practice.

In spite of the healthy growth which the Society is enjoying, there are still a considerable number of physicians, who are eligible to membership, but who have not affiliated with organized medicine. This is only because they have not come to realize the manifold privileges of membership.

The growth and strength of professional organizations generally has focused the attention of the public upon them, so that more and more membership is being associated in the public mind with competence and progressiveness. This is particularly true of the medical society because the public knows it is primarily an educational organization.

The prestige value of medical society membership will continue to increase. Therefore, since state legislatures have been so liberal in granting legal recognition to practitioners of irregular schools, the intelligent public no longer depends upon the legal conferring of the title "doctor" as a guarantee of the physician's competence. To a considerable extent the criterion of medical society membership is being applied by the public as an index of the professional standing of the physician. It is inevitable therefore that the importance of membership will be brought to attention of physicians with increasing force.

I urge the various delegates to impress upon the physicians in their locality the increasing significance of medical society membership to the end that every eligible physician be brought within our folds.

A detailed report of the work of the past year will be presented by the executive secretary.

Report of the Executive Secretary

Clyde C. Foley, Executive Secretary, presented his annual report as follows:

I have the honor to report the following summary of the activities of your executive office during the past year.

The medical profession of Oregon has reason to be proud that its state medical society has been a pioneer in medical organization by its early adoption of a full-time program. In the present day the well-being of the individual professional man can only be achieved through a strong central organization. The physicians of Oregon very early perceived this fundamental fact with the result that your state medical society enjoys the distinction of being one of the outstanding medical societies of the country from the standpoint of the progressive service which it is rendering. The broad and complete character of the society's service is symbolized in the fact that its office is always open, day and night, Sunday and holiday. It is, in actual fact, "the medical society that never closes."

The full-time state medical society program recognizes that the first duty of a medical society is to do what it can to make every member a better physician, but proceeds upon the principle that there are other obligations fully as compelling.

Chief among these is the task of insuring that the practice of medicine rests upon a sound economic basis. To neglect this duty is to court disaster for the public as well as the profession. The physician today is bound down with a tremendous overhead expense which absorbs almost one-third of his gross income. He is subjected to the fear of unjust suits for malpractice by those who seek to evade payment for his services and, because of the too liberal advance of credit to all who seek his necessary aid, he collects on the average but about one-half of the amount placed upon his books. Truly these are conditions which call for intelligent consideration from his medical society.

Economic Services of the Society. The executive office of the Oregon State Medical Society is conscious of the importance of the economic problems in the field of medicine. It has attempted in a small way, to offer a solution to some of these problems. The following economic services have now been established:

(1) Medical Defense. This entitles the member to the services of the Society's legal counsel, executive office, and medical defense committee in any unjustifiable malpractice suit. If necessary, the defense is continued to the State Supreme Court. The efficiency of this service is exemplified in the almost negligible number of cases lost since its inauguration. In addition to the moral advantages of this service, members receive the legal assistance of the Society's counselors who have had a very wide experience in this field of law. As a part of this service, the Society also studies the causes of suits and carries on a continuous campaign of education among physicians to reduce the number of suits.

(2) Physician's Liability Insurance. Some members rely entirely upon the defense service of the Society as a protection against the contingency of a malpractice suit. Most members, however, now take advantage of the special arrangement which the society has made with several of the large insurance companies and carry liability insurance as well, which indemnifies in case a judgment should be secured. Due to the alertness of the society, members enjoy one of the lowest rates for this type of insurance which prevails in any state in the country. This insurance can be secured directly through the society office.

(3) Industrial Medical Service. The placing of the administration of medical service for workmen engaged in hazardous occupations under the control of the State Industrial Accident Commission has profoundly affected the economics of medical practice. The large volume of medical service under the control of this lay commission is illustrated by the annual expenditure for this aspect of industrial rehabilitation, which aggregated $642,124.35 for the year ending June 30, 1927. Justice to the injured workman and to the physician demands that the conditions under which industrial medical work is done shall be such as to make possible the rendering of the highest type of service with reasonable remuneration to the physician. The State Medical Society is constantly observing and studying industrial medical conditions to the end that this desirable result may be attained. At the present time a statewide survey of industrial accident work is being made. This survey will form the basis for certain constructive recommendations to the Governor and the State Legislature.

(4) Doctor's Exchange Service. The State Society, in co-operation with the Portland City and County Medical Society, supplies at cost to the physicians of Portland a constant and expert twenty-four hour secretarial service conforming with the Code of Ethics of the American Medical Association. The establishment of this service is an excellent example of how the society can function in protecting the physician's economic interests and in safeguarding the ethical traditions which are so dear to the medical profession. The exchange was organized by the society to meet an unfortunate situation that had developed out of certain overly commercial tendencies of a privately operated exchange. The Society's exchange saves the physicians of Portland over $20,000 per year and handles over 70,000 calls annually.

(5) Registry for Nurses, Technicians, and Office Assistants. This service provides without charge a reliable source from which may be met the needs of physicians and hospitals who desire workers having credentials and records which have been carefully investigated.

(6) Physicians' Advisory and Placement Service. The Society is making an earnest effort to the end that all parts of the state may have adequate medical service and that there may not be an over supply of physicians in any locality. Advice is given to many physicians, both inside and outside the state, who are just entering practice, or who are dissatisfied with their present location. In this way we are able to assist towns in securing a physician and to help the newcomer locate most advantageously to himself and in fairness to those already in practice. Another aspect of the Society's placement service is to supply relief for physicians during vacation and other times when it may be necessary for a physician to leave for an extended period.

(7) Proposed Credit Bureau. No other business or professional man suffers so acutely as the physician from the unlimited and uncontrolled extension of credit. There are a number of general credit and collection bureaus now in the field. Many of these are entirely unreliable and all are unsatisfactory in that information concerning the general credit of many persons is no index of the character of the risk from the physician's point of view. The function of securing accurate credit ratings for the use of the doctor is another example of an economic service which can best be rendered by the profession itself working collectively through its medical society. The present plan is to organize a bureau in Portland within the next few months. If the plan is successful, it is likely that it will be placed upon a state-wide basis.

(8) General Information Service. During the course of the year we handled hundreds of inquiries relating to the nonscientific aspects of the practice of medicine. Some of the queries were concerning legal matters, the interpretation of state and federal laws and regulations, the requirements for licensure, opportunities for graduate study, material and suggestions for talks before lay groups, the standing of various physicians and hospitals, and the value of various therapeutic appliances and supplies. A notarial service was also provided without cost to members.

Public Health Educational Program. Fully as important as the economic function of the State Medical Society is the duty of insuring that the people of Oregon are properly informed as to the aims of medical science and the important part which scientific medicine is playing in their daily life. The successful application of scientific principles in the prevention of disease and in the treatment of the sick depends upon an informed lay public. It is especially necessary that attention be given to the sound education of the public, because so much false information is being disseminated by followers of irregular schools of healing, whose weird doctrines are without scientific foundation.

During the past few years the Oregon State Medical Society has conducted an active campaign of public education by promoting the circulation of *Hygeia*, the American Medical Association's "Health Magazine for the Public," and through the distribution of instructive pamphlets, posters, periodic health examination material, etc., written by recognized medical authorities. The office has offered assistance in the compilation of material for addresses on health topics by supplying abstracts and illustrative material, as well as by furnishing speakers and motion picture programs for churches, clubs, and other organizations. During the past year several thousand people were reached through the medium of pamphlets, public meetings, and individual inquiries by letter or person. Our executive office also made its various materials available to our day and night exchange and in this way several thousand additional persons were reached over the telephone.

Information Service on Nostrums and Quackery. In addition to positive educational instruction concerning health matters, the public needs to be warned of the pitfalls of nostrums and quackery, and at the same time given accurate information concerning the education and standing of trained and reliable physicians. For this purpose we have installed a complete file of data concerning every regular physician, dentist, nurse, masseur, and technician in the state, as well as information on every irregular practitioner. A similar file of information on various quack medicines and appliances is maintained. We furnish this information to the Better Business Bureau, newspapers, public libraries, hospitals, physicians, and the general public without charge. The lists of physicians which appear in general directories, telephone directories, and elsewhere are now carefully checked to ensure the public dependable information.

The number of inquires for this information answered by mail and telephone now aggregates several hundred annually. A majority of the requests for information are from Oregon and Washington, but it is surprising to note that a considerable number have been received from a great many other states.

An interesting example of the importance of this service occurred during the recent investigation of the notorious Kirkpatrick consumption "cure" in Portland. We investigated the cases of one hundred and forty-four of the Kirkpatrick victims and found that eighty-nine were dead, that twenty-six were still actually tuberculous following the treatment, that nine claimed improvement without scientific corroboration, and that in twenty cases the condition of the patient was not ascertainable. The presentation of this data was the determining factor which caused the Mayor's committee to report that the Kirkpatrick remedy was a menace.

Co-operation in Medical Law Enforcement. The extensive public educational program of the Society makes it inevitable also that physicians and lay people should now lodge with its office most of the complaints relating to the unlawful practice of medicine and surgery. Several of these complaints are received weekly and referred to the State Board of Medical Examiners, with whom we co-operate very closely. Before this is done, however, the office files are carefully searched and information concerning the irregular practitioners complained of is thus made available to the state board.

The secretary has carefully watched health legislation in Congress and endeavored to keep the Oregon members supplied with accurate information. This activity was responsible for the favorable consideration which the Oregon members gave to the establishment of the Gorgas Memorial Laboratory Institute in Panama, and the defeat of the proposal to increase the Harrison Narcotic tax from one to three dollars per year. We also informed our members in Congress of the unsoundness of a number of bills designed to regulate the healing art in the District of Columbia. Much effort was also expended to create a favorable decision with respect to making deductible the federal income tax item of traveling expenses incurred by physicians in attending meetings of medical organizations. A measure to accomplish this passed the Senate, but was rejected by the House of Representatives.

During the past year we also have completed the compilation of a two hundred page volume entitled "The Oregon Medical Blue Book." The manuscript is now in the hands of the printer and distribution of the book will be made within the next few weeks.

The Oregon Medical Blue Book represents a further attempt upon our part to serve the profession by making available in convenient and compact form a dictionary of all Oregon licentiates in medicine and surgery, with accurate biographical data concerning our members, detailed information concerning hospitals and other medical institutions, data on all general and special medical societies, and a summary of all the important laws and regulations relating to medical practice with the personnel of the various boards and commissions which administer these laws and regulations. In short, the plan is to provide for you a complete handbook of information on the practice of medicine in Oregon.

It is our earnest hope that the publication of this volume will bring to the attention of the physicians of the state the important contribution which the Oregon State Medical Society is intending to make to their professional life. To make such a contribution is the dominating motive of your executive staff.

Collection Services

Dr. Robert C. Coffey stated that Dun and Company were providing a very efficient collection service at a rate much lower than the usual rates of colilar type of service was being rendered by Bradstreet's. Dr. Sommer further remarked that the secretaries of physicians should be instructed as to the proper method of billing and collecting by the executive office of the Society.

Upon motion duly made and seconded, it was voted that the presentation of the Treasurer's relection agencies. Dr. E. A. Sommer said that a simport be postponed until the Saturday session.

Report of Committee on Scientific Work

Dr. Frederick D. Stricker, chairman, moved that the printed program be made the report of this committee. The motion was seconded and it was voted that the program be accepted as the report of the committee and filed.

Report of Committee on Public Policy

In the absence of Dr. E. B. McDaniel, chairman, the executive secretary read the following report:

The committee calls the attention of the House of Delegates to the need for activity on the part of every local society to the end that the members of the state legislature be apprised of the importance of enacting a basic science act at the 1929 session of the legislature. Several hundred copies of the Washington basic science law were placed in the hands of our members and the candidates for the legislature at the last primary election. We urge all our members to inform themselves on the fundamental features of this law and to explain the purpose of the law to such members of the legislature as they may know.

The committee notes with gratification the increased public educational activity of the executive office. A number of public meetings were held during the course of the year at which several thousand people were given some of the basic facts of medical science. Some fifteen or twenty members have given health talks before various clubs and lay organizations. We now have built up a speaker's bureau on a limited scale and during the coming year hope to have every lay club and organization in the state devote at least one meeting during the year to a consideration of some aspect of health.

The committee calls attention to the fact that osteopaths and chiropractors are reported to be starting a nation-wide campaign to have the doors of the hospitals opened to them. Every member of the Society should inform himself concerning the hospital standardization movement so that this backward step can be prevented.

The committee notes with pleasure the increasing circulation of *Hygeia* in Oregon and again urges all physicians to provide this magazine for their waiting-rooms.

Respectfully submitted:
E. B. McDaniel, Chairman
Ralph A. Fenton
Wilson Johnston
Joseph A. Pettit
Roy S. Stearns
Hugh S. Mount
L. B. Bouvy

Report of Committe on Publications

In the absence of Dr. C. J. Smith, chairman, Dr. Robert C. Coffey presented the following report:

The Constitution and By-Laws enacted by this society during its last annual meeting have made the Committee on Publications an important committee.

Article II of the Constitution, setting out the purposes of the Society, reads: "and to the enlightenment of public opinion in regard to the great problems of medicine so that the profession shall maintain high and honorable standards within itself and be useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life."

Article X of the Constitution reads: "Funds may also be raised . . . from the Society's publications."

Chapter VIII, Section 1 of the By-Laws provides for standing committees which includes a Committee on Publications, and reads further: "Unless otherwise provided in these By-Laws each of these committees shall consist of three members, each of whom shall serve for a term of three years. One member of each of these committees, except the Committee on Publications, shall be appointed annually by the President, by and with the consent of the House of Delegates or the Council," etc.

Chapter VIII, Section 4 of the By-Laws: "The Committee on Publications shall also be the Board of

Journal Trustees. One member of this Committee which shall consist of three members shall be elected annually by the House of Delegates. This Committee shall have full power to act in the interest of the Society on all questions relating to publications."

The wisdom of entrusting this power to a small committee was shown during 1927 before the new Constitution and By-Laws were adopted. The newspapers at that time demanded information at once relative to a quack cure. It had to be supplied authoritatively and in the name of the Society within a few hours. A group of men interested in the subject at hand was speedily called together. An answer was outlined, and a member of the Publication Committee delegated to present the statement.

The prompt action of the committee saved the medical profession much embarrassment and criticism.

Previous to the adoption of these new documents, the Publication Committee and the Journal Trustees were separate. The functions of the Journal Trustees are chiefly honorary, as at present the actions regarding our official journal, NORTHWEST MEDICINE, are simple. Under the able editorship and management of Dr. Clarence A. Smith, the physicians of the Pacific Northwest have an official publication of the highest type as regards scientific articles, news reports, items of interest, and advertising. Advertising which is unethical in any manner is rejected.

The editorials are well selected, well written, and on timely subjects. We are to be congratulated on having a man of Dr. Smith's ability at the head of this important undertaking. Dr. Smith has been the editor of NORTHWEST MEDICINE during the more than twenty-five years of its existence, and has built it up to its present size and standing. NORTHWEST MEDICINE has been the official journal for the Oregon State Medical Society, and all of those who are members of the Oregon State Medical Society are on the mailing list.

NORTHWEST MEDICINE has a circulation of over two thousand, it being sent to every member of the state societies of Oregon, Washington and Idaho. It is also the official journal of the Pacific Northwest Medical Association.

During the recent meeting of the Pacific Northwest Medical Association in Tacoma in July, the Trustees representing Oregon, Washington, and Idaho met at luncheon with Dr. Smith and the other executives of NORTHWEST MEDICINE. The annual reports were read and the conditions of the journal considered. For many years the publication had a hard struggle, but now it is on a safe financial basis. It is not the aim that the journal shall be a money maker. Whenever profit is shown, it is devoted to enlarging the publication along conservative, ethical lines. The trustees there assembled, reelected Dr. Smith editor for a period of three years, which action we feel assured meets with the hearty approval of all the members of the three state societies interested.

The report of this Committee on Publications submitted at the last annual meeting at which time the personnel was made up of Drs. House, Coffen, and Bettman, contained many valuable recommendations. We desire to quote portions of that report and to urge the adoption of the recommendations made at that time and to stress the importance of carrying them into effect at once.

"The Publications Committee recommends that the physicians throughout the state make special effort to the end that their patients subscribe for *Hygeia*. This journal should be on the waiting-room table of every physician and dentist in Oregon, and in the homes of their patients.

"We recommend that the medical society set aside a fund for the purpose of providing copies of *Hygeia* to high school and college libraries, and the recreation rooms of large corporations and clubs. We also recommend that copies of books such as Fishbein's '*Medical Follies*' be placed in every library in the state and in libraries of high schools and other institutions of higher learning.

"We recommend that a systematic effort be made to furnish to the newspapers of the state items of public interest on medical subjects. These items preferably should be sent out through the executive secretary or through representatives in various cities, that they may be properly vised before publication, so as to bring out helpful features and eliminate harmful ideas and self advertising.

"The state society should have available for the use and distribution of its members various publications on quackery, nostrums, and the protection of research, etc., gotten out by the American Medical Association, and members should be urged to call upon the executive secretary for these pamphlets which the state society should furnish gratis. A definite amount of money should be appropriated for this purpose.

"The state society should publish a monthly bulletin to be sent to the members of the medical profession, informing them of the activities, and keeping them definitely informed on all matters pertaining to the profession. This bulletin should not contain scientific matter. Special issues should be devoted to special problems and these issues distributed to a selected group of laymen."

The report last year recited that the Oregonian had granted the Publications Committee space for an article in each of its Sunday issues. The plan to have various physicians write articles for the public press proved disappointing. One of the members of the committe voluntarily wrote several articles. About a month ago, he submitted them to the other available member, who, after going carefully over them, was of the opinion that in the form submitted, the articles would not be entirely suitable and might give offense to the public. Owing to the illness of the chairman of this committee, no meeting has been held and no meeting has been called. It is therefore recommended that the House of Delegates appoint a full committee and that all articles for publication be submitted to the organized committee before publication in the lay press.

As a means of enlightening public opinion, the Medical Society Telephone Service, operating the Doctors' Official Telephone Service for the Portland City and County Medical Society has been of great value as people are learning to call the Medical Society when seeking information on any question having a medical bearing.

We are glad to be able to state that plans are on foot whereby the society will shortly have spacious offices on the ground floor of the new Medical-Dental Building of Portland, where its activities may be carried on to better advantages.

The Committee on Publications also desires to commend the Doctors' Official Telephone Service for its action in bringing before the people in their advertising the relationship between the American Medical Association and efficiency in medical service.

During the past year, no emergency has arisen, but the committee has been on constant watch, and through the efficient executive secretary, Mr. Clyde C. Foley, has attended to many small details.

Respectfully submitted this day, Sept. 20, 1928.

C. J. Smith, Chairman
R. C. Coffey
A. G. Bettman

Upon motion duly made and seconded, it was voted that the report be accepted and placed on file. Upon motion duly made and seconded it was voted that nominations for the Committee on Publications be placed in the hands of the Nominating Committee. Upon motion duly made and seconded, it was voted that the suggestions of Dr. Robert C. Coffey for a restatement of the functions of the Committee on Publications oe laid on the table until the Saturday session.

President Mount appointed the following committees: New Business, William Kuykendall, L. B. Bouvy, and Joseph A. Pettit; Unfinished Business, Robert C. Coffey, Edward L. Zimmerman, and A. E. Mackay; Resolutions, John W. Sifton, Charles E. Hunt, and Thomas J. Higgins; Credentials, Alvin W. Baird, W. W. Baum, and S. H. Sheldon; Nominations, H. J. Clements, William Kuykendall, E. A. Sommer, and John W. Sifton.

At 9:00 a.m. the House adjourned until Saturday at 7:30 a.m.

SECOND SESSION

Saturday, Sept. 22

The second session of the House of Delegates was called to order by President Hugh S. Mount at 7:30 a.m., in Room 101 of the Hotel Multnomah.

On roll-call, the following officers and councilors were present: Hugh S. Mount, L. B. Bouvy, John W. Sifton, Clarence W. Keene, Frederick D. Stricker. J. Earl Else, Joseph A. Pettit, William Kuykendall, Charles E. Sears, C. L. Booth, H. J. Clements, George E. Houck, Wilson Johnston, and the executive secretary.

The following delegates were present: Thomas J. Higgins, William B. Neal, Stanley Lamb, A. E. Mackay, C. H. Manlove, John H. Rankin, S. H. Sheldon, E. A. Sommer, R. H. Wellington, Fred Ziegler, and David Robinson.

The following members of the Society were also present: Robert C. Coffey, A. G. Bettman, John H. Fitzgibbon, all of Portland, and R. C. Faust of Eugene. Dr. Clarence A. Smith of Seattle, Wash., editor of NORTHWEST MEDICINE, was also present.

Upon motion duly made and seconded, it was voted that the proposal of Robert C. Coffey with respect to the Committee on Publications be taken from the table.

Upon motion duly made and seconded, it was voted to recommend to the Society that the following changes in the by-laws be made:

To amend the second sentence of Section 3 of Chapter VIII to read as follows:

This committee shall determine the character and scope of all communications intended for the enlightenment of the public through the lay press and shall represent the Society in securing and enforcing legislation in the interest of public health and of scientific medicine.

Committee on Public Policy. To amend the third sentence of Section 4 of Chapter VIII to read as follows:

This committee shall have full power to act in the interest of the Society on all questions relating to strictly scientific publications.

Committee on Publications. Upon motion duly made and seconded, it was voted that, inasmuch as the present by-laws leave the duties of these committees subject to interpretation, the ideas embodied in the foregoing amendments be acted upon during the ensuing year, pending their incorporation into the by-laws.

Report of Committee on Medical Defense

Dr. Wilson Johnston, chairman, presented the following report:

This report covers the period between September 1927 and September 1928. At the beginning of the period four suits were pending and since that time thirteen have been started. Of these, six have been won by physicians and none have been lost. There are still pending at the close of the period eleven cases. During the year the Supreme Court has handed down three decisions, two of which were in favor of physicians and one confirming the judgment of the lower court against a physician.

Recently two suits have been brought on account of burns by diathermy. In one of these a verdict has been obtained in favor of the physician. As diathermy is being quite generally used, we wish to call the attention of the profession to these suits and advise that they take every precaution to avoid burns and also keep a very complete record as to the length of time of the treatment and the amount of current used.

This year the fact was brought out that the cost of defending physicians who carry insurance with companies which do not maintain an Oregon office is very much greater than where such an office is maintained and direct contact with the agents and their lawyers may be had.

We, therefore, urge the members of the Society to carry insurance with companies regularly doing business in the State and particularly with those having the approval of the State Society.

Respectfully submitted,
Wilson Johnston, Chairman
Roy McDaniel
Frank E. Butler

Report of the Treasurer

Dr. J. Earl Else, treasurer, made the following report of the finances of the Society as prepared by P. W. Janney, Certified Public Accountant:

Sept. 20, 1928.

Oregon State Medical Society,
Portland, Oregon.

Gentlemen:

In accordance with your instructions, I have made an audit of the books and records of the Oregon State Medical Society and submit herewith appropriate comments and Exhibits and Schedules enumerated as follows:

Exhibit "A"—Balance Sheet as at August 31, 1928. Schedule 1—Statement of Investments.

Exhibit "B"—General Fund Statement of Income and Surplus for period Sept. 1, 1927, to Aug. 31, 1928.

Exhibit "C"—Medical Defense Fund Statement of Income and Surplus for period Sept. 1, 1927, to Aug. 31, 1928.

Exhibit "C"—General Fund Statement of Cash Receipts and Disbursements for period Sept. 1, 1927, to Aug. 31, 1928.

Exhibit "E"—Medical Defense Fund Statement of Cash Receipts and Disbursements for the period Sept. 1, 1927, to Aug. 31, 1928.

SCOPE OF AUDIT

All of the necessary verification incident to a complete audit was made, particular attention being taken to see that all expenditures during the period incident to the conduct of the Society's affairs were duly authorized by officers elected for that purpose. The receipt and payment of all collections made which were all allocable to other Societies were carefully examined and the Exhibits and Schedules attached herewith reflect the true condition of the Society's affairs for the period Sept. 1, 1927, to Aug. 31, 1928.

ASSETS

Cash in Bank $4,792.97—is made up of deposits as follows:

General Fund	$2,020.52
Medical Defense Fund	2,772.45
Total	$4,792.97

Bank balances were confirmed by certificates obtained from depositories. The audit disclosed that in several instances checks drawn to different funds were credited to the wrong account through error at the bank. I would suggest in this connection that owing to the similarity of names of the accounts it would be well to deposit the funds in separate depositories to avoid errors.

Members Dues Receivable $1,436.75—represents unpaid dues from members as follows:

Dues Receivable General Fund	$2,546.50
Less—proportion allocable to Oregon Public Health League	1,511.25
	$1,035.25
Dues Receivable Medical Defense Fund	501.00
	$1,536.25
Less Reserve for uncollectible dues	99.50
Total as per Balance Sheet	$1,436.75

The accounts were reviewed in detail with the Executive Secretary and in my opinion the reserve set up will be sufficient to cover uncollectible items.

It is noted that the recommendation in the previous Auditor's report regarding the advisability of setting up the Members' Dues Receivable in the general accounting records has not been carried out. This is also my recommendation and I would be pleased to assist in setting up the proper records.

Accounts Receivable—Oregon Public Health League $564.00—represents amount due on account of various overpayments of proportion of dues collected from members which were allocable to the Oregon Public Health League. I have furnished the bookkeeper with a detailed statement of the items contained in this balance and this amount should be retained from subsequent collections for the account of the Oregon Public Health League.

Investments $10,937.50—is made up of investments as per schedule, held by the General Fund and Medical Defense Fund as follows:

General Fund	$ 3,455.00
Medical Defense Fund—	7,482.50
	$10,937.50

United States 3rd 4¼% Liberty Loan Bonds, which matured on Sept. 15, 1928, have been cashed since the date of the audit. Interest in the amount of $516.20 has accrued on these investments, the details of which are shown in the Investment Schedule.

Due from Receiver Ralph Schneeloch Company $5,945.00. Under dates of June 24, 1927, and July 7, 1927, the Society purchased and acquired through exchange of bonds with the Ralph Schneeloch Company, Portland, Oregon, interim certificates for the following securities:

Cert. No.	Dated	Securities	Cost	Par Value	Int. Rate
1115	6-24-27	City of Copenhagen	$1,945	$2,000	5%
1128	7- 7-27	1st Mortgage Bonds	2,000	2,000	6%
1129	7- 7-27	1st Mortgage Bonds	2,000	2,000	6%
			$5,945	$6,000	

These securities were apportioned one half each to the General Fund and to the Medical Defense Fund.

Subsequent to the purchase this Company passed into the hands of a receiver who is now liquidating the business.

It is required under the Statutes of the State of Oregon that dealers in securities issuing interim certificates must secure the holders thereof by segregating and holding apart from other assets of the dealer bonds or securities in a sum equal to the amount of the interim certificates issued and outstanding. In this connection we quote from a verification letter obtained from the Receiver as follows: "Ralph Schneeloch Co. had segregated for the protection of all outstanding interim certificates, securities which, with any proceeds thereof, are held as a separate fund for the payment of such interim certificates and accrued interest thereon at the contract rate." In the absence of definite information as to whether the net proceeds of the securities held by the Receiver would be sufficient to cover I have set up the full amount without provision for possible loss. In this connection also I have not deemed it advisable to set up the accrued interest receivable on the above items.

LIABILITIES

Warrants Payable—General Fund $606.42—represents warrants drawn for August, 1928, bills and collections made for other Societies. Payments of these items was made in September, 1928.

Accounts Payable—General Fund $7.50—is amount due Portland City and County Society for collections made for their account and withheld in error.

Surplus $21,585.03—is made up as follows:

Surplus—General Fund	$ 8,205.53
Surplus—Medical Defense Fund	13,379.70
	$21,585.23

The detail of the items contained in the Surplus of the General Fund, is shown in Exhibit "B" and of Medical Defense Fund in Exhibit "C," and is self explanatory.

CONTINGENT LIABILITIES

A contingent liability exists in an unnamed amount for unpaid bills incurred in connection with the Oregon Medical Blue Book now being prepared for publication. The Executive Secretary of the Society assured your Auditor that the receipts from advertising already contracted for would be more than sufficient to cover the liability.

GENERAL

It was found that the Medical Defense Fund was indebted to the General Fund in the amount of $12.45, made up as follows:

Overpayment collections		$160.45
Check No. 21—Medical Defense Fund charged to General Fund		5.00
		$165.45
Less August collections	$102.00	
June 12 deposit to General Account in error	51.00	153.00
Balance Due		$ 12.45

As August collections were paid by check in September it will be necessary for the Medical Defense Fund to reimburse the General Fund in the amount of $114.45 during the next fiscal period.

I wish to thank the Officers and Employees of the Society for their courtesy and cooperation during the course of the audit.

Very truly yours,
(Signed) P. W. Janney,
Certified Public Accountant.

GENERAL FUND AND MEDICAL DEFENSE FUND

BALANCE SHEET

as at August 31, 1928

Assets

Current			
Cash in Bank—General Fund		$2,020.52	
—Medical Defense Fund		2,772.45	$ 4,792.97
Members' Dues Receivable—			
—General Fund		$2,546.50	
—Medical Defense Fund		501.00	
		$3,047.50	
Less proportion allocable to Oregon Health League	$1,511.25		
Reserve for Uncollectible Dues	$ 99.50	$1,610.75	1,436.75
Account Receivable—Oregon Public Health			564.00
Accrued Interest Receivable			516.20
Total Current Assets			$ 7,309.92
Investments			10,937.50
Due from Receivers Ralph Schneeloch Co.			5,945.00
Fixed			
Office Furniture and Fixtures			273.20
			$24,465.62

Liabilities

Current		
Warrants Payable		$ 606.42
Accounts Payable		7.50
Unearned Dues—General Fund		1,589.17
—Medical Defense Fund		677.50
Total Current Liabilities		2,880.59
Surplus—General Fund	$ 8,205.33	
—Medical Defense Fund	13,379.70	21,585.03
		$24,465.62

GENERAL FUND

STATEMENT OF INCOME AND SURPLUS

SEPT. 1, 1927, TO AUG. 31, 1928

Income	
Members Dues	$3,190.71
Interest Earned	190.00
Sale Health Manuals and Blanks	11.45
Mailing Service	37.50
Rental Exhibit Space	60.00
	$3,489.66

Exhibit "A"

Schedule 1

STATEMENT OF INVESTMENTS—AUGUST 31, 1928

Description	Maturity	Coupon Rate, %	Interest Payable	Cost	Par Value	Accrued Interest
General Fund						
Rep. of Pan. No. M2089	12- 1-1956	6½	June 1 — December 1	$1,030.00	$1,000.00	$ 81.25
City of Copenhagen No. 14184-5....	6- 1-1952	5	June 1 — December 1	1,945.00	2,000.00	75.00
Interstate Pub. Serv. Company No. D623..	6- 1-1956	5	June 1 — December 1	480.00	500.00	18.75
Total				$3,455.00	$3,500.00	$175.00
Medical Defense Fund						
U. S. 3rd Lib. L. Bonds	9-15-1928	4¼	March 15 — September 15	5,000.00	5,000.00	209.95
Rep. of Pan. No. M2090	12- 1-1956	6½	June 1 — December 1	1,030.00	1,000.00	81.25
City of Copenhagen No. 14186........	6- 1-1952	5	June 1 — December 1	972.50	1,000.00	37.50
Interstate Pub. Serv. Company No. D624..	6- 1-1956	5	June 1 — December 1	480.00	500.00	12.50
Total				$7,482.50	$7,500.00	$341.20

Expenses		
Annual Meeting	$526.71	
Campaign for A. M. A. Conv.	250.00	
Northwest Medicine	557.00	
Salaries	300.00	
Rent	297.00	
Office Expense	109.92	
Postage	224.42	
Printing and Multigraphing	406.93	
Telephone and Telegraph	41.93	
Audit	150.00	
Miscellaneous	232.28	3,096.19
Net Income		393.47
Add—Surplus Sept. 1, 1927		7,811.86
Surplus—August 31, 1928		$8,205.33

MEDICAL DEFENSE FUND

STATEMENT OF INCOME AND SURPLUS

SEPT. 1, 1927, TO AUG. 31, 1928

Income		
Members' Dues		$ 1,398.00
Interest Earned		352.50
		$ 1,750.50
Expenses		
Legal Exp.—Defense of Members	$473.45	
Telephone	1.45	
Miscellaneous	5.00	479.90
Net Income		1,270.60
Add—Surplus as at Sept. 1, 1927		12,109.10
Surplus—August 31, 1928		$13,379.70

GENERAL FUND

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

SEPT. 1, 1927, TO AUG. 31, 1928

Balance in Bank Sept. 1, 1927			$ 1,452.03
Receipts			
Members' Dues			11,358.75
Agency Collections			
Portland City and Co. Soc.		$1,926.50	
Eastern Oregon Society		32.00	
Mid-Columbia Society		26.00	
Southern Oregon Society		7.00	1,991.50
Rentals—Exhibit Space			60.00
Miscellaneous Income			162.45
Total Receipts			13,572.70
Total			$15,024.73
Disbursements			
Oregon Public Health League		$6,035.50	
Medical Defense Fund		1,961.90	
Agency—Disbursements			
Portland City and Co. Soc.	$1,854.00		
East. Oregon Soc.	31.00		
Mid-Columbia Soc.	26.00		
South. Oregon Soc.	7.00	1,918.00	
Northwest Medicine		557.00	
Rental		297.00	
Salaries		275.00	
Office Supplies and Expenses		117.87	
Printing and Multigraphing		326.05	
Postage		224.42	
Annual Meeting		591.91	
Campaign A. M. A. Conv.		250.00	
Telephone and Telegraph		52.03	
Auditing		150.00	
Bank Collection Charges		.55	
Miscellaneous		246.98	13,004.21
Balance in Bank—Aug. 31, 1928			$ 2,020.52

Medical Defense Fund

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
SEPT. 1, 1927, TO AUG. 31, 1928

Balance in Bank—Sept. 1, 1927		$ 1,192.70
Receipts		
Members Dues		1,910.90
Miscellaneous		143.75
Total Receipts		2,054.65
Total		3,247.35
Disbursements		
Legal Defense of Members	$473.45	
Telephone	1.45	474.90
Balance in Bank—Aug. 31, 1928		$ 2,772.45

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

Upon motion duly made and seconded, it was voted that P. W. Janney, Certified Public Accountant, be employed as auditor for the ensuing year.

Dr. Else urged the careful conservation of the funds in order that the Society may at some future time handle medical defense and liability insurance for its members.

Upon motion duly made and seconded, it was voted that the Committee on Auditing and Appropriations be directed to prepare a budget for the ensuing year.

Report of Committee on Medical Education and Hospitals

The executive secretary reported that the committee had no meetings during the year but that Dr. John G. Cheetham, chairman, had prepared a statement as follows:

The work of this committee during the past year has not been excessively active but nevertheless a few plans have been evolved which we would recommend as suitable for further adoption. In the first place, a classification of all hospitals in the state is contemplated. This is not meant to be in conflict with the scope of the directory of the American Medical Association which frankly admits a wide range. It is classification, but is rather to be of the nature of a local review to meet the local situation and to let the Oregon profession realize the exact status, the ethicalness, and working conditions in all of our hospitals. A questionnaire plan would seem best which might be submitted by aid from individual doctors in diverse localities.

In the second place, it has been brought to our attention that there is no system of standardization for the admission of individual doctors to practice in given hospitals. A questionnaire is planned whereby statements will be received from the better known hospitals giving the requirements necessary for admission to the staff and, after a study of these replies, it is possible that a definite standard can be set which might be of use to all of our medical institutions.

For another thing we would urge the use of more consultations than has been the present habit and especially in such cases as are of an unusual procedure. It has been brought to our attention that one case causing more than local criticism, such criticism reaching to the point of investigation, revealed the fact that the case had been treated in a thorough approved manner and we feel in urging more consultations that such incidents as this, together with the reverse types might be avoided.

A fourth point considered is that of standardization of interne services. While several of our hospitals are meeting quite fully the requirements of the American Medical Association, there are others in which we know this to be done possibly fully in spirit but yet not 100 per cent so far as fulfillment is concerned, and we would urge the adoption of the American Medical Association standards where practical and in the cases of smaller hospitals, which can not fully meet such requirements, that a given system of teaching the interne, or resident, or student resident, as the case might be, could be formulated with great advantage not only to the student but to the hospital itself.

In Portland, we are aware with pleasure of the recent government activities which will give us a splendid new hospital for services to the disabled veterans of our war. We are pleased to note also additional teaching facilities for teaching purposes with the government institutions. We might urge that the Medical School possibly be a little more lenient in the admission of younger men to its teaching staff. We have come in contact with a number of men from the outside who have held teaching positions in the recognized larger institutions in the country and who are only too anxious to help to the extent of their ability with the teaching of our younger men in this state.

Respectfully submitted,
John G. Cheetham.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file and that a copy of the matter in the report, except that portion relating to the University of Oregon Medical School, be sent to every hospital in the state.

Report of Committee on Auditing and Appropriations

Dr. John H. Fitzgibbon, chairman, reported that the committee had held only one meeting during the year which was very poorly attended and that the committee therefore had no report to make. Dr. Fitzgibbon stated that the committee was in hearty accord with the proposed budget plan.

Report of Committee on Cancer Control

In the absence of Dr. Otis B. Wight, chairman, the executive secretary reported this committee had no report to make. Dr. J. Earl Else, a member of the committee, stated that, while the Society committee had not been active during the year, some work had been done by the Oregon Committee of the American Society for the Control of Cancer. Dr. Else further stated that plans were being made to hold public meetings on cancer prevention as well as to have the Woman's Auxiliary arrange for talks before the various women's clubs in the state.

Report of Committee on Public Health and Disease Prevention

In the absence of Dr. E. B. Pickel, chairman, the executive secretary read the following report:

The chief activity of this committee has been in connection with the promotion of the periodic health examinations. The work began two years ago on this important aspect of preventive medicine and has continued vigorously.

The committee has developed a comprehensive examination blank after a number of conferences with leading physicians following the various specialties. A sample book of this blank has been mailed to every member of the Society. These blanks have been printed in considerable quantity and are available on paper suitable for office files at the actual cost price of five cents per blank. Numerous requests for blanks have already been filled.

Several demonstrations of the technic of making examinations have been held. Some of the requests for these demonstrations have been from other states. The Committee urges all the local societies to interest themselves in periodic health examinations and to keep the subject constantly before their members.

The committee desires to note the excellent position which Oregon now has with respect to certain important phases of public health. Through the widespread use of toxin-antitoxin the diphtheria rate has been reduced one-half. Oregon also has the lowest infant death rate in the United States, and during the past year made the second largest reduction in maternal deaths among the various states. These are public health achievements of outstanding merit in which we can justly take great pride.

Respectfully submitted,
E. B. Pickel, Chairman
W. B. Morse
C. J. Smith
Harold C. Bean
J. H. Rosenberg
William T. Phy
Frederick D. Stricker.

Report of Committee on State Industrial Affairs

In the absence of Dr. E. B. McDaniel, chairman, the executive secretary read the following report:

Our committee has attempted to make a comprehensive survey of the industrial accident work in the state from the standpoint of the physician. For this purpose a questionnaire was prepared and sent to each of the twelve hundred physicians in the state. Three hundred fifty physicians replied to this questionnaire. The recommendation which the committee makes is based upon the replies received.

While there were a considerable number of minor criticisms concerning the operation of the industrial accident law the dissatisfaction of physicians with the law centers chiefly around two points: (1) the inadequacy of the fee schedule and (2) certain difficulties in the relations between the commission and physicians who handle industrial accident cases.

The committee recommends that the Oregon State Medical Society express itself as of the opinion that the law is not sufficiently liberal in the compensation paid to injured workmen nor in the fees paid to physicians and hospitals for their services and that there should be a substantial increase in the schedule for these items. The fees of physicians and hospitals are based upon pre-war costs and do not reflect the effort involved in rendering the service at the present time.

The committee also feels that the relations between the commission and the physicians of the state could be very much improved by having a permanent committee handle all the grievances of physicians so that they might have a regular means of bringing their side of the question before the commission as well as have the backing of the State Medical Society. It is particularly needful that the commission be more considerate of the work which physicians do which is not reflected in the more or less inflexible schedule of fees which the commission uses. It is particularly desirable that some provision be made so that physicians might be paid in cases where what are apparently industrial accidents turn out to be of a nonindustrial origin. Fairness to the physician would dictate that the commission pay for the negative diagnosis which physicians make in these cases.

In conclusion, the committee believes that it has obtained a firm grasp of the problems in industrial accident work and believes that within the course of the next year a definite solution can be worked out for the difficulties which the physician now faces.

Respectfully submitted,
E. B. McDaniel, Chairman
Joseph A. Pettit
Ralph A. Fenton
Roy S. Stearns
Hugh S. Mount
L. B. Bouvy.

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file and that the suggestion in the report be referred to the Committee on Resolutions to be embodied in suitable resolutions.

Report of Committee on Military Affairs

The executive secretary read the following report of the committee:

Efforts were made to stimulate an interest in the Medical Reserve Corps of the Army in a general way.

Endeavors were made to get Medical Reserve Officers, Medical Administrative Reserve Officers and Dental Reserve Officers to attend a Troop School which was instituted by Herbert C. Mallory, Major, Medical Corps, who was assigned to duty at these headquarters. Two meetings of the school were held each month and the average attendance was approximately seventy officers at each meeting, several officers coming from out of the city.

Shortly after the Troop School was well under way War Department orders were received relieving Major Mallory from duty at these headquarters.

The matter was then taken up with the Oregon Senators and Representatives in Congress and several telegrams and letters were sent by Reserve and civic organizations and private citizens individually. By this action we were able to obtain a cancellation of the orders above mentioned and the Troop School was continued throughout the year until the summer vacation period.

The Troop School will begin again during the first part of October and all Medical Reserve Officers will find it to their interest to attend.

H. M. Greene, Chairman.

Dr. H. M. Greene, chairman of the Committee on Military Affairs, made the suggestion that representations be given on next year's committee to the medical departments of the Army and Navy, the Marine Corps, and the National Guard, as well as to the Medical Reserve Corps.

Report of Committee on Revision of Constitution and By-Laws

In the absence of Dr. R. H. Wellington, chairman, the executive secretary read the following report:

The committee believes that the present state society constitution as revised at the 1927 session fills the needs of the society in an acceptable manner. Our attention has been directed, however, to the lack of uniformity now existing in the constitution and by-laws of the various component societies. We therefore recommend that a copy of the model county constitution and by-laws prepared by the American Medical Association be sent to each component society by the executive office of the state medical society with the suggestion that each society examine its constitution with a view to revising it as far as possible in accordance with the model document.

Respectfully submitted,
R. H. Wellington, Chairman
George Vandervert
J. C. Hayes
A. G. Allen
John B. Gregory

Report of Committee on Honorary Membership

In the absence of Dr. J. H. Robnett, chairman, the executive secretary read the following report:

The committee after careful consideration of the various members who might properly be elected to honorary membership, recommends to the House of Delegates that Dr. E. B. Pickel of Medford and Dr. C. J. Smith of Portland be elected honorary members of this Society.

Respectfully submitted,
J. H. Robnett, Chairman
Calvin White
C. J. Bartlett

President Mount stated that Dr. C. J. Smith desired to remain on the list of active members.

Upon motion duly made and seconded, it was voted that Dr. E. B. Pickel be recommended to the Society for election to honorary membership; this action to be retroactive to include the year 1927, and that a letter be addressed to Dr. C. J. Smith, expressing the appreciation of the Society for his long and valuable services to the medical profession.

Upon motion duly made and seconded, it was voted that the report of the Committee on Necrology be presented at the general session of the Society.

Other Reports

Dr. Robert C. Coffey, chairman of the Committee on Unfinished Business, reported that there was no unfinished business on hand.

Dr. William Kuykendall, chairman of the Committee on New Business, reported that no new business had been referred to the committee.

Dr. John H. Fitzgibbon, chairman of the Welfare Committee, reported that the committee had had under consideration a number of plans for providing insurance for Society members, but that no satisfactory plan had yet been developed.

Upon motion duly made and seconded, it was voted that a special committee be appointed to cooperate in the work of the National Society for the Prevention of Blindness and that an amendment to the bylaws be presented to the Society creating a standing committee on this subject.

At the suggestion of Dr. Robert C. Coffey, the executive secretary read the following excerpt from the report of the Committee on Publications complimenting the work of Dr. Clarence A. Smith, editor of NORTHWEST MEDICINE:

Under the able editorship and management of Dr. Clarence A. Smith, the physicians of the Pacific Northwest have an official publication of the highest type as regards scientific articles, news reports, items of interest, and advertising. Advertising which is unethical in any manner is rejected.

The editorials are well selected, well written, and on timely subjects. We are to be congratulated on having a man of Dr. Smith's ability at the head of this important undertaking. Dr. Smith has been editor of NORTHWEST MEDICINE during the more than twenty-five years of its existence, and has built it up to its present size and standing.

Report of Committee on Resolutions

Dr. John W. Sifton, chairman, presented the report of the committee as follows:

To the House of Delegates:

"Be it resolved that this Society express its gratitude and pleasure in the improvement of the health of its worthy member, Dr. C. J. Smith, and trust that he may be completely restored to health and vigor and be with us again at our next meeting.

"Be it further resolved that the Society express its appreciation to the officers, committees, and all those who helped to make this fifty-fourth annual meeting the success that it has been.

"Be it further resolved that, through the Committee on State Industrial Affairs, that certain changes and improvements be made relative to state industrial accident work. To this end we recommend that, in line with the program outlined by Dr. Hugh S. Mount in his annual address before this Society, an advisory board, consisting of a director with several consultants, be elected from the State Society to confer with the State Industrial Accident Commission in all matters pertaining to state industrial accident work and to represent the members of this Society in all cases brought before this commission; consultants to be appointed in various parts of the state to help supervise the work done by the various physicians, and said director and consultants to receive pay for actual work done. We also recommend a rearrangement of the schedules for compensation paid the worker, the rates paid the hospitals, and the fees paid the physicians and dentists as we feel that these rates and fees are at present too low.

"Be it further resolved that the Executive Committee of the Oregon Public Health League and the Committee on State Industrial Affairs of this Society be separated into two committees in place of working as one committee as at present."

Respectfully submitted,
J. W. Sifton, Chairman
Charles E. Hunt
T. J. Higgins.

Report of Committee on Nominations

Dr. H. J. Clements, chairman, presented the following recommendations of the committee:

For President-Elect—Wilson Johnston, Portland.
For First Vice-President—John W. Sifton, Hood River.
For Second Vice-President—Laurence Selling, Portland.
For Third Vice-President—F. G. Swedenburg, Ashland.
For Secretary—Frederick D. Stricker, Portland.
For Treasurer—J. Earl Else, Portland.
For Councilors for First District—C. L. Booth, Portland, and Charles E. Sears, Portland.
For Councilor for Eighth District—W. P. McAdory, La Grande.
For Councilor for Fifth District (to fill out term of C. J. Smith, Portland, resigned)—Hugh S. Mount, Oregon City.
For Councilor for Sixth District (to fill out term of Wilson Johnston, Portland, recommended for President)—E. A. Sommer, Portland.
For Committee on Publications—
Three year term—C. J. Smith, Portland.
Two year term—Robert C. Coffey, Portland.
One year term—A. G. Bettman, Portland.

Upon motion duly made and seconded, it was voted that this report be accepted and submitted to the general session of the Society.

Upon motion duly made and seconded, it was voted that the proposal of Dr. Wilson Johnston to amend the first sentence of Article VII of the constitution to read as follows be submitted to the general session of the Society:

The Council shall consist of nine councilors, the officers of the Society, the retiring president, and any officer or delegate of the American Medical Association residing in this state.

The object of Dr. Johnston's amendment is to add to the Council the retiring president so that his valuable services to the Society may continue.

At 9:00 a.m., the House adjourned until 2:00 p.m.

THIRD SESSION

Saturday, Sept. 22

The third session of the House of Delegates was called to order by President Hugh S. Mount at 2:00 P.M., in the ballroom of the Hotel Multnomah.

Roll call was dispensed with.

Report of Delegate to American Medical Association

Dr. William Kuykendall, delegate to the American Medical Association, presented the following report of the 1928 session of the Association:

To the Oregon State Medical Society:

As your representative, I attended the Seventy-ninth Annual Session of the American Medical Association held at Minneapolis, June 11 to 15, 1928. I beg leave to submit the following report.

All the proceedings of the Association are so completely reported in the Journal that it hardly seems necessary for me to go into detail.

In a general way the session at Minneapolis may be considered successful. The accommodations were good, the entertainment excellent, and the weather as rainy as the most ardent webfooter could have desired. The scientific sessions and exhibits were of extraordinary excellence and value.

The meetings of the House of Delegates were unusually pleasant and free from acrimony. Possibly this was partly due to the absence of any striking legislative problems for consideration. Only a few minor changes were made in the constitution.

The perennial discussion of amendment of the Volstead Law and regulations under it failed to produce the usual fireworks. A committee had been authorized to confer with the Secretary of the Treasury and other officials to see if some changes could not be made to allow physicians greater liberty and at the same time to prevent abuses. The committee found that it was up against a big problem, and that it could not get even the physicians to agree upon a remedy. It, therefore, asked for further time.

There has been a widespread demand for a revision of the revenue laws so as to meet better the needs of the physician. It has been asked that physicians be allowed deduction from their income tax for travel expenses going to and from professional meetings.

There was also demand for the modification of the narcotic law so as to permit physicians to prescribe such drugs by telephone. There was also rather a wide demand for the withdrawal of the inhibitions against heroin.

The latter proposal was vetoed by the A. M. A. Council on Pharmacy and Chemistry who declared heroin not be "therapeutically indispensable," and renewed its approval of the present law.

On all these questions the proper officers and committees of the American Medical Association have been very active and even aggressive, but so far have not been able to produce much result.

I speak of this to bring you assurance that the American Medical Association has been unceasingly active in looking after the interests of the Fellows of the Association.

I now come to what is probably the most interesting matter I have to report.

For the past year or more there has been talk of asking that the next meeting of the American Medical Association be held at Portland.

At the last meeting of your Board of Councilors, before the Minneapolis meeting, we were requested and instructed to present an invitation to the American Medical Association to hold its 1929 session in the city of Portland.

I want to acknowledge at this time the very great value of the assistance rendered by our member of the Board of Trustees, Dr. Joseph Pettit. He was always "on the job," pushing every advantage and meeting every threat of opposition. His wide acquaintance and official position made his work especially effective.

In any case, as you already know, we were successful in our efforts and the American Medical Association is to come to Portland next year.

Having done my part to bring about that result and having now officially informed you of that fact, my duty in relation thereto would seem to be at an end. Therefore, as your representative, I hand the whole matter over to you for further consideration and development. I do not mean by this to wash my hands of the whole subject; I shall be glad to render any assistance within my power and to coöperate with you and with the profession of Portland, to make the 1929 session of the American Medical Association pleasant and profitable to our visiting brethren and a credit to Portland.

As the representative of this state-wide organization, I want to press home upon you the responsibility of the Oregon State Medical Society toward our great national association which is to be brought out to the Far West for our special benefit.

We must not fail to do our very best to care for and entertain this host of visiting physicians. We can do this in part by beginning now to plan to attend the sessions. They are brought out here largely for the benefit of the physicians of this area.

I want to impress upon you that they are to be the guests of the profession of the whole state, not of Portland alone. The duty of entertainment must be undertaken by the whole state, if the very best results are attained. We must help by our attendance, our influence and by our dollars. We must all realize that it is going to cost some money to put up the kind of entertainment we will all be proud of.

In closing this report, I want to say that of all the sessions of the American Medical Association I have attended, the ones that stand out most distinctly as to success of the entertainment features have not been those marked by lavish expenditures, but those marked by the distinct spirit of personal hospitality which is most often found in the West and the South. Therefore, I would ask you not only to give liberally of your dollars, but to put your individual effort and personality into the welcome and entertainment of these visiting physicians.

In this way I think we can make the Portland session of 1929 stand out in the lives of these thousands of visitors as the high water mark of American Medical Association instruction and entertainment.

Respectfully submitted,
W. Kuykendall, Delegate to the
American Medical Association
from the Oregon State Medical
Society.

At 2:30 p. m. the House adjourned sine die.

GENERAL BUSINESS SESSION OF THE SOCIETY

Saturday, Sept. 22

The business session of the Society was called to order by President Hugh S. Mount at 2:30 p.m. in the Ballroom of the Hotel Multnomah.

Report of Committee on Necrology

Dr. William Kuykendall presented the following report of the Committee on Necrology:

We, your committee on Necrology, beg leave to submit the following report:

Nearly two score of the fellows of this Society have fallen by the wayside, since our last session. All were good men and true—worthy exemplars of a most worthy profession. One might be inclined to single out this one or that one because of long years of service or peculiar excellencies in some department of the work, or because of special efforts for the public good. However, we shall resist any such inclination and shall draw no invidious distinctions. When the last analysis has been made and the work of each man has been subjected to the scrutiny of the eternal verities, it will be found that each had done his very best, according to his light.

What more can any man do than his very best? One may run farther or faster than another in doing an act of mercy or charity, but he who runs his very best is as worthy as he who flies on the wings of the wind. So, we shall not single out any of this noble company for special eulogies. Each was a worthy exemplar of a profession in which he only shines who is willing to sacrifice self for the good of fellow man. Whether the life has been long or short, it has in each case been devoted with singleness of purpose to the relief of human suffering. Each held out a helping hand to his fellow beings in many a dark hour of suffering and distress. Of each we can truly say, that the world has been better and happier because he lived.

As we pause a moment on the threshold of our own busy lives, it behooves us to give thought to all that was worthy and noble and enduring in the lives of our departed fellows. Could these men speak to us today, they would tell us to waste no time in tears, but to go earnestly and cheerfully forward to carry out the work they have so worthily begun. They have flung us the torch, and call to us to "carry on."

They can no longer spread cheer and blessing along the way. We can in no better way honor them than to emulate their splendid example and to carry forward the work they have been compelled to lay down.

We wish we might say some word to cheer the sorrow of those who have been left in the broken home circles of these, our fellows. Such griefs are better not touched by our clumsy fingers. They have one heritage which nothing can ever take from them —the memory of years in association with a MAN in a noble fight against the misfortunes of humanity. We may well join them in thanks to the good Father of all for the loan, for all these years, of their helpful association, courageous friendship and loyal love.

We can only extend to the immediate family of our departed fellows, our most profound sympathy, and an offer of any possible service on their behalf that may promise help, relief or comfort.

As we stand a moment with bowed heads, let us read the names of our departed fellows, resolving to forget their faults, to emulate their virtues, to cherish their memory and to carry forward the noble work for humanity which they have been compelled to relinquish.

The following is a list of the physicians of this state, who have passed on since our last session:

George Valney Ketchum, of Portland, July 27, 1927
Frank W. Wallace, of Oregon City, Aug. 25, 1927
Samuel M. Strohecker, of Portland, Aug. 27, 1927
George Lawrence Hill, of Medford, Sept. 25, 1927
August Kinney, of Astoria, Nov. 1, 1927
John Flanders Beaumont, of Portland, Nov. 29, 1927
William E. Welch, of Rainier, Dec. 9, 1927
Thompson G. Heine, of Medford, Dec. 27, 1927
William Franklin Pruden, of Portland, Jan. 17, 1928
Richmond Kelly, of Portland, Feb. 22, 1928
Charles Simpson West, of Portland, March 8, 1928
William R. Laidlaw, of Portland, March 16, 1928
David F. Lane, of Salem, March 17, 1928
G. A. Pogue, of Ontario, April 9, 1928
G. J. McFaul, of Pendleton, April 20, 1928
Eldred B. Waffle, of Astoria, April 23, 1928
Frederick W. Prentice, of Eugene, May 16, 1928
James Thomas Wood, of McMinnville, June 4, 1928
Robert J. Conroy, of Medford, Sept. 12, 1928

We suggest that this report be spread upon the minutes of this session and a copy be sent to the family of each departed fellow.

Respectfully submitted,
W. Kuykendall
Bernard J. Rea
Emil C. Joseph

The secretary made the following report of the actions of the House of Delegates:

Report of House of Delegates

To the Members of the Oregon State Medical Society:

I wish to present the following summary of the action taken by the House of Delegates:

1. It authorized the appointment of a committee from the Council to act as an advisory Council to the Woman's Auxiliary.

2. Upon recommendation of the Committee on Publications the House voted to amend Section 3, Chapter VIII in the by-laws to define the scope of the work of the Committee on Public Policy to include: "This committee shall determine the character and scope of all communications intended for the enlightenment of the public through the lay press and shall represent the Society in securing and enforcing legislation in the interest of public health and of scientific medicine," and Section 4, Chapter VIII, to define the scope of the work of the Committee on Publications as follows: "This committee shall have full power to act in the interest of the society on all questions relating to strictly scientific publications." These amendments to be acted upon at the 1928 meeting of the House of Delegates. Inasmuch as the present by-laws leave the duties of these committees subject to interpretation the House voted that the ideas embodied in these amendments be acted upon during the coming year.

3. Upon the recommendation of the Committee on Auditing and Appropriations, the House voted to operate during the coming year on a budget basis.

4. The House voted that a copy of the matter in the report of the Committee on Medical Education and Hospitals which relates to hospital administration be sent to every hospital in the state.

5. Upon the recommendation of the Committee on the Revision of Constitution and By-Laws, the House voted that a copy of the model county constitution and by-laws prepared by the American Medical Association be sent to each component society by the executive office of the State Medical Society with the suggestion that each society examine its constitution with a view to revising it as far as possible in accordance with the model document.

6. The House voted that for the consideration of the legislature the Committee on Public Policy be instructed to prepare an amendment to the medical practice act of the state to permit the use of all funds of the board, after the expenses of administration have been paid, for the purpose of maintaining a circulating library in connection with the University of Oregon Medical School Library for the use of all licensed practitioners of medicine and surgery in the state.

7. The House voted that a special committee be appointed for the purpose of carrying on the work of the National Society for the Prevention of Blindness in this state and that an amendment be placed in the by-laws creating such a committee.

8. The following report of the Committee on Resolutions was adopted. This report which follows is now presented for the consideration of the Society:

"Be it resolved that this Society express its gratitude and pleasure in the improvement of the health of its worthy member, Dr. C. J. Smith, and trust he may be completely restored to health and vigor and be with us again at our next meeting.

"Be it further resolved that the Society express its appreciation to the officers, committees, and all those who helped to make this fifty-fourth annual meeting the success that it has been.

"Be it further resolved that, through the Committee on State Industrial Affairs, certain changes and improvements be made relative to State Industrial Accident work. To this end we recommend that, in line with the program outlined by Dr. Hugh S. Mount in his annual address before this Society, that an advisory board consisting of a director with several consultants be elected from the State Society, to confer with the State Industrial accident work and to represent the members of this Society in all cases brought before this commission. Consultants to be appointed in various parts of the state to help supervise the work done by the various physicians, and said director and consultants to receive pay for actual work done. We also recommend a rearrangement of the schedules for compensation paid the workers, the rates paid the hospitals, and the fees paid the physicians and dentists as we feel that these rates and fees are at present too low.

"Be it further resolved that the Executive Committee of the Oregon Public Health League and the Committee on State Industrial Affairs of this Society be separated into two committees in place of working as one committee as at present."

9. The following amendment to Article VII of the Constitution as recommended by Dr. Wilson Johnston was approved for presentation to the Society. This amendment, if adopted by the Society, will be acted upon at the 1928 meeting of the House of Delegates and, if approved, will be placed in the Constitution. Dr. Johnston's proposed amendment is that Article VII of the Constitution be amended to read: "The Council shall consist of nine Councilors, the officers of the Society, the retiring president, and any officer or delegate of the American Medical Association residing in this state."

The object of Dr. Johnston's amendment is to add to the Council the retiring president so that his valuable services to the Society may continue.

10. Upon the recommendation of the Committee on Honorary Membership, the House voted to recommend Dr. E. B. Pickel of Medford for election to honorary membership, this action to be retroactive to include the year 1927.

Upon motion duly made and seconded, it was voted that the actions and recommendations of the House of Delegates as set forth in the secretary's report be approved.

The secretary reported that the House of Delegates had made the following nominations for officers for the ensuing year:

For President-Elect—Wilson Johnston, Portland

For First Vice-President — John W. Sifton, Hood River

For Second Vice-President—Laurence Selling, Portland

For Third Vice-President—F. G. Swedenburg, Ashland

For Secretary—Frederick D. Stricker, Portland

For Treasurer—J. Earl Else, Portland

For Councilors for First District—C. L. Booth, Portland, and Charles E. Sears, Portland

For Councilor for Eighth District—W. P. McAdory, La Grande

For Councilor for Fifth District (to fill out term of C. J. Smith, Portland, resigned)—Hugh S. Mount, Oregon City

For Councilor for Sixth District (to fill out term of Wilson Johnston, Portland, recommended for President)—E. A. Sommer, Portland

For Committee on Publications:
Three year term—C. J. Smith, Portland
Two year term—Robert C. Coffey, Portland
One year term—A. G. Bettman, Portland.

President Mount called for further nominations for President-Elect. There being no further nominatitons from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. Wilson Johnston. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Johnston was declared elected.

President Mount called for further nominations for First Vice-President. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. John W. Sifton. The Secretary, as instructed, cast the individual ballots of the members and Dr. Sifton was declared elected.

President Mount called for further nominations for Second Vice-President. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. Laurence Selling. The Secretary, as instructed, cast the individual ballots of the members and Dr. Selling was declared elected.

President Mount called for further nominations for Third Vice-President. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. Swedenburg. The Secretary, as instructed, cast the individual ballots of the members and Dr. Swedenburg was declared elected.

President Mount called for further nominations for Secretary. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. Frederick D. Stricker. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Stricker was declared elected.

President Mount called for further nominations for Treasurer. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary instructed to cast the individual ballots of the members for Dr. J. Earl Else. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Else was declared elected.

President Mount called for further nominations for Councilor One for the First District. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary be instructed to cast the individual ballots of the members for Dr. C. L. Booth. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Booth was declared elected.

President Mount called for further nominations for Councilor Two for the First District. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary be instructed to cast the individual ballots of the members for Dr. Charles E. Sears. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Sears was declared elected.

President Mount called for further nominations for Councilor One for the First District. There beno further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary be instructed to cast the individual ballots for Dr. W. P. McAdory. The Secretary, as instructed, cast the individual ballots of the members, and Dr. McAdory was declared elected.

President Mount called for further nominations for Councilor Two for the First District. There beterm of Dr. C. J. Smith, resigned. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary be instructed to cast the individual ballots of the members for Dr. Hugh S. Mount. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Mount was declared elected.

President Mount called for further nominations for Councilor for the Sixth District to fill out the term of Dr. Wilson Johnston, President-Elect. There being no further nominations from the floor, on motion duly made and seconded, it was voted that the rules be suspended and the Secretary be instructed to cast the individual ballots of the members for Dr. E. A. Sommer. The Secretary, as instructed, cast the individual ballots of the members, and Dr. Sommer was declared elected.

President Mount expressed his thanks to the Society for the honor of having served as its president, after which he announced that it was now in order to seat the new president, Dr. L. B. Bouvy. Dr. Bouvy was escorted to the chair by Drs. Robert C. Coffey, W. B. Holden and Frank Boyden.

After receiving the congratulations of the outgoing President, Dr. Bouvy thanked the Society for the privilege of serving as President and pledged himself to serve the Society to the best of his ability.

The business session of the Society was declared adjourned at 3:00 p. m., and the Society assembled in scientific session.

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OREGON PUBLIC HEALTH LEAGUE

REPORT OF ANNUAL MEETING AT HOTEL MULTNOMAH, PORTLAND, ORE.

Saturday, Sept. 22, 1928

The annual meeting of the Oregon Public Health League was called to order by President E. A. Sommer at 1:15 P.M. in Room 106 at the Hotel Multnomah.

The following officers were present: E. A. Sommer, C. L. Booth, H. J. Clements, Frederick D. Stricker, C. J. McCusker, Ralph A. Fenton, Wilson Johnston, Joseph A. Pettit, and the executive secretary. The following directors were present: L. B. Bouvy, T. Homer Coffey, William Kuykendall, C. Ulysses Moore, W. B. Morse, Hugh S. Mount, and A. M. Webster. The following members were present: Stanley Lamb, Richard P. Landis, E. L. Zimmerman, Ralph M. Dodson, Harry M. Bouvy, A. W. Moore, Kittie Plummer Gray, A. G. Bettman, Charles L. Rybke, A. A. Witham, Frank Boyden, John H. Fitzgibbon, R. G. Faust, and William House. The following visitors were present: J. Tate Mason, of Seattle, and William L. Bishop and Dewitt C. Burkes, of Portland.

Upon motion duly made and seconded, it was voted to dispense with the reading of the minutes of the last meeting, the minutes having been printed in the December, 1927, number of Northwest Medicine.

President Sommer called attention to the fact that the full-time program inaugurated by the League has been responsible for the increased activity of the office of the State Medical Society. Dr. Sommer emphasized the point that the League is bearing all the expense of maintaining the State Medical Society office except for the scientific part of the Society's work and that this has made possible the splendid condition of the State Medical Society's finances.

Report of Treasurer

Dr. C. J. McCusker, Treasurer, presented the following report of the finances of the League, as prepared by P. W. Janney, Certified Public Accountant:

September 20, 1928.

Oregon Public Health League,
315-316 Medical Arts Building,
Portland, Oregon.

Gentlemen:

At your request I have audited the records of the Oregon Public Health League for the year ended August 31, 1928, and submit EXHIBIT A—STATEMENT OF NET WORTH AS AT AUGUST 31, 1928, and EXHIBIT B—SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED AUGUST 31, 1928.

Cash on deposit at the First National Bank, Portland, Oregon, was verified by certificate of that depository.

Cash received was verified by comparison with the records of the Oregon State Medical Society, by agreement with which Society one-half the dues paid by Active Members is alloted to the League. The audit of the Oregon State Medical Society disclosed an over-payment to the League during the year ended August 31, 1928, in the amount of $564.00. This sum will be deducted from future remittances to the League.

Members' Dues Receivable represents the League's portion of the unpaid dues of the Oregon State Medical Society.

Accounts Receivable is the League's share of the August collections of members' dues. This amount was turned over to the League in the early part of September.

Disbursements were verified by examination of vouchers and cancelled checks, which were found to be properly authorized and signatured.

It is your Auditor's opinion that the bookkeeping of the League would be improved materially by the introduction of more complete accounting records.

Very truly yours,
(Signed) P. W. Janney.

Exhibit A

STATEMENT OF NET WORTH AS AT AUGUST 31, 1928

Assets		
Cash in First National Bank	$2,580.15	
Members' Dues Receivable	1,511.25	
Account Receivable—Oregon State Medical Society	298.12	
Total Assets		$4,389.52
Liabilities		
Unpaid Warrants	$ 398.00	
Unearned Dues	2,225.00	
Due Oregon State Medical Society	564.00	
		3,187.00
Net Worth		1,202.52
		$4,389.52

Exhibit B

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED AUGUST 31, 1928, AND COMPARISON

	Year Ended Aug. 31, 1928	Seven Mos. Ended Aug. 31, 1927
Balance at Beginning of Period	$2,557.61	$3,164.12
Receipts—		
Oregon State Medical Society	6,035.50	3,527.00
Advertising	....	29.50
Total Receipts	$6,035.50	$3,556.50
Total	$8,593.11	$6,720.62
Disbursements—		
Salaries	$4,142.58	$2,546.08
Office Supplies and Expense	236.55	245.63
Postage and Express	209.26	45.00
Telephone and Telegraph	155.56	56.39
Rent	324.00	162.00
Traveling Expense	56.72	99.11
Publicity	429.62	....
Office Furniture	99.00	27.50
Legal Expense	321.70	....
Legislative Expense	....	871.20
Miscellaneous	37.97	110.10
Total	$6,012.96	$4,163.01
Balance at End of Period	$2,580.15	$2,557.61

Upon motion duly made and seconded, it was voted that this report be accepted and placed on file.

Report of Executive Secretary

Clyde C. Foley, Executive Secretary, presented the following summary of the work of the executive office:

I have the honor to submit the following report of our activities. Much of this report was presented to the House of Delegates of the Oregon State Medical Society, but inasmuch as the work of the Society and the League are so closely related the report will no doubt be of interest to both bodies.

Fully as important as the scientific and economic functions of the State Medical Society is the duty of insuring that the people of Oregon are properly informed as to the aims of medical science and the important part which scientific medicine is playing in their daily life. The successful application of scientific principles in the prevention of disease and the treatment of the sick depends upon an informed lay public. It is especially necessary that attention be given to the sound education of the public, because so much false information is being disseminated by followers of irregular schools of healing, whose weird doctrines are without scientific foundation.

During the past few years the Oregon State Medical Society has conducted an active campaign of public education. This activity has been carried on through the Oregon Public Health League, which cooperates very closely with the Society's Committee on Public Policy and Legislation. Every member of the State Medical Society is a member of the League and shares in the advantages that accrue from a lay public which is informed and sympathetic to the aims and methods of regular physicians.

Positive Health Educational Work of the League. The League seeks to educate the public by materially increasing the circulation of "Hygeia," the American Medical Association's "Health Magazine for the Public," by the dissemination through lay publications of carefully prepared articles, and through the distribution of instructive pamphlets, posters, periodic health examination material, etc., written by recognized medical authorities. The League also offers assistance in the compilation of material for addresses on health topics by supplying abstracts and illustrative material, as well as furnishing speakers and motion picture programs for churches, clubs, and other organizations. Each year several thousand people are reached through the medium of pamphlets, public meetings, and individual inquiries by letter or person. The League also makes its various materials available to the Medical Society's day and night exchange and in this way several thousand additional persons are reached over the telephone.

Information Service on Nostrums and Quackery. In addition to positive educational instructions concerning health matters, the public needs to be warned of the pitfalls of nostrums and quackery, and at the same time given accurate information concerning the education and standing of trained and reliable physicians. For this purpose, the League maintains a complete file of data concerniug every regular physician, dentist, nurse, masseur, and technician in the state, as well as information on every irregular practitioner. A similar file of information on various quack medicines and appliancies is maintained. The League furnishes this information to the Better Business Bureau, newspapers, public libraries, hospitals, physicians, and the general public without charge. The lists of physicians which appear in general directories, telephone directories, and elsewhere are carefully checked to ensure the public dependable information.

The number of inquiries for this information answered by mail and telephone aggregate several hundred annually. A majority of the requests for information are from Oregon and Washington, but it is surprising to note that a considerable number are received from a great many other states.

Co-operation in Medical Law Enforcement. The League's public education program makes it inevitable also that physicians and lay people should lodge with its office most of the complaints relating to the unlawful practice of medicine and surgery. Several of these complaints are received weekly and referred to the State Board of Medical Examiners, with whom the League co-operates very closely. Before this is done, however, the office files are carefully searched and information concerning the irregular practitioners complained of is thus made available to the state board.

Consulting Service in Public Health Legislation. The League recognizes the necessity of the proper presentation of sound scientific opinion in legislative and political matters relating to public health. Therefore, the Executive Secretary carefully scrutinizes all public health measures which are introduced into the state legislature, and furnishes the legislators with accurate scientific information on these questions. The League has thus been instrumental in defeating many unsound and vicious pieces of legislation including several anti-vaccination measures, a measure to require that all prescriptions be written in English, a certain measure that would have opened the hospitals of the state to all the various types of irregular practitioners, and several measures to repeal the law requiring the medical examination of male applicants for marriage licenses. Perhaps the most outstanding of the constructive achievements of the League was the insertion of the requirement in the chiropractic and naturopathic codes that all applicants for such licenses must be graduates of a standardized high school or possess the equivalent of such education as determined by the state superintendent of public instruction.

The League was also largely responsible for securing at the last session of the legislature important amendments to the medical practice act which materially strengthened the medical law enforcing machinery. The League has also been campaigning for the past two years to secure the passage of a basic science law which will require all persons who apply to the state for a license to practice the healing art to show a reasonable knowledge of the fundamental sciences. We hope to secure the enactment of this measure at the 1929 session of the legislature.

The League also carefully watches health legislation in Congress and endeavors to keep the Oregon members supplied with accurate information. At the last session of Congress this activity was responsible for the favorable consideration which the Oregon members gave to the establishment of the Gorgas Memorial Laboratory Institute in Panama, and the defeat of the proposal to increase the Harrison Narcotic tax from one to three dollars per year. The League also informed our members in Congress of the unsoundness of a number of bills designed to regulate the healing art in the District of Columbia. Much effort was also expended to create a favorable decision with respect to making deductible, in computing the federal income tax, travelling expenses incurred by physicians in attending meetings of medical organizations. A measure to accomplish this passed the Senate, but was rejected by the House of Representatives.

The League office maintains carefully kept records of the views of candidates for public office toward public health questions and assists favorable candidates in their campaign for election. Prior to every state election and every important local election the League sends information concerning candidates and measures to every physician, dentist, nurse, and pharmacist in the state, in addition to a large number of intelligent lay people who realize the value of a sound scientific approach to the problems of disease. As a part of its public service the League office also acts in a consulting capacity to organizations seeking to secure the enactment of measures affecting the public health.

During the past year, also, we have completed the compilation of a two hundred page volume entitled the Oregon Medical Blue Book. The manuscript is now in the hands of the printer and distribution of the book will be made within the next few weeks.

The Oregon Medical Blue Book represents a further attempt upon our part to serve the profession by making available in convenient and compact form a directory of all Oregon licentiates in medicine and surgery, with accurate biographical data concerning our members, with detailed information concerning hospitals and other medical institutions, data on all general and special medical societies, and a summary of all the important laws and regulations relating to medical practice with the personnel of the various boards and commissions which administer these laws and regulations. In short, the plan is to provide for you a complete handbook of information on the practice of medicine in Oregon.

It is our earnest hope that the publication of this volume will bring to the attention of the physicians of the state the important contribution which the Oregon State Medical Society and the Oregon Public Health League are attempting to make to their professional life. To make such a contribution is the dominating motive of your executive staff.

Upon motion duly made and seconded, it was voted voted that this report be accepted and placed on file.

Election of Directors

The following nominations were made for the office of director for the three year term ending in 1931:

Frank Boyden	Portland
T. Homer Coffen	Portland
Wilson Johnston	Portland
L. B. Bouvy	La Grande
W. T. Phy	Hot Lake
Warren C. Hunt	Klamath Falls
E. A. Woods	Ashland

Upon the motion duly made and seconded, it was voted that the nominations be closed and the executive secretary instructed to cast a unanimous vote for the above-named candidates. The executive secretary, as instructed, cast the unanimous vote for these candidates and they were declared elected.

Dr. Joseph A. Pettit called attention to the efforts exerted by the League to secure favorable action in Congress on the proposal to permit the deduction of physician's traveling expenses in computing the federal income tax. He urged early action to bring Congressman Hawley to a favorable view on this question.

Upon motion duly made and seconded it was voted that a committee of physicians from Mr. Hawley's district be appointed to confer with him at an early date.

President Sommer called upon Dr. J. Tate Mason of Seattle, who told of the good work of the Washington Public Health League and how they had recently lost their executive secretary, Robert O. Jones, who is now with the Gorgas Memorial Institute. He congratulated the Oregon League on the efficiency of its executive secretary and urged that a plan be devised whereby his services could be made available to a combined Pacific Northwest Public Health League to include the States of Oregon and Washington.

The meeting adjourned at 2:00 p.m.

Meeting of Board of Directors

A meeting of the Board of Directors was held at 7:30 P. M. in the Ballroom of the Hotel Multnomah.

The following directors were present: L. B. Bouvy, Robert C. Coffey, J. Earl Else, Ralph A. Fenton, Wilson Johnston, Noble Wiley Jones, William Kuykendall, C. Ulysses Moore, W. B. Morse, and Hugh S. Mount.

The following officers were unanimously elected for the ensuing year:

President	E. A. Sommer, Portland
First Vice-President	C. L. Booth, Portland
Second Vice-President	H. J. Clements, Salem
Secretary	Frederick D. Stricker, Portland
Treasurer	C. J. McCusker, Portland

Executive Committee—
E. B. McDaniel, Portland;
Ralph A. Fenton, Portland;
Wilson Johnston, Portland;
Joseph A. Pettit, Portland;
Roy S. Stearns, Portland.

The meeting adjourned at 7:45 p.m.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

The general meeting on Oct. 1 was called to order at 8:15 by Dr. Hall. The minutes of the general meeting of Sept. 10, held jointly with the Medical Section, were read and approved.

The applications for membership of Drs. P. Livingston Barnes, Donald G. Corbett, Roll Newell Dillon, John S. Lingenfelter and I. A. Schueler were balloted upon, and each was duly elected.

Application of Drs. V. S. McDaniel and Frances R. McLoughlin for membership in the Society were read.

The proposed amendment to the by-laws of the Society was given its second reading.

Dr. H. J. Davidson read a paper entitled "Duodenal Syndrome and Its Surgical Significance." He emphasized the point that the stimuli which result in the sensation of nausea followed by vomiting and accompanying symptoms, usually ascribed as having origin in the stomach, are in reality of duodenal origin. He discussed the subject from a hereditary and embryological viewpoint, as well as from acquired conditions. He stated that surgery directed to the duodenum itself should be resorted to only after every possible means had been taken to exclude reflex action on the duodenum. He summarized the paper as follows:

1. The symptoms heretofore quite universally ascribed to the stomach directly or excited reflexly by various abdominal and extra-abdominal pathology are precisely symptoms of duodenal dysfunction. The dysfunction may be of reflex origin or due to organic duodenal or paraduodenal pathology.

2. Duodenal dysfunction is a more accurate term than duodenal dilation. It is more descriptive and more inclusive. The latter is but the end result in some cases of the former.

3. Stimuli resulting in the sensation of nausea followed by vomiting and other accompanying symptoms originate in the duodenum and are carried retrograde to the musculature of the stomach.

4. In cases of duodenal dysfunction, duodenotoxic substances of undetermined nature are thrown into

the circulation in sufficient quantity to produce clinical symptoms.

5. Duodenal dysfunction, with or without dilation, is a diagnosable condition and warrants duodeno-jejunostomy if adequate cause of the manifest duodenal dysfunction is not found elsewhere.

6. Rapid uninterrupted transit of contents from and through the duodenum is necessary to prevent induction of systematic manifestations of duodenal dysfunction.

The presentation of this paper was followed with a discussion by Dr. M. F. Dwyer, who complimented Dr. Davidson and Dr. Wheelon on their operation, which has had national recognition. He believes this syndrome is rare, as are also the indications for operation.

In responding, Dr. Wheelon referred to Dr. Dwyer's discussion, and explained the functional importance associated with the syndrone, summing up the procedure as a means of drainage. He believes the disturbed function of the duodenum is frequently overlooked and confused with the symptoms of the stomach and gallbladder.

Dr. Davidson, in closing, stated that he had expected more discussion, especially by stomach specialists. He concluded by bringing out the pertinent points of the paper, particularly in reference to stomach symptoms, stressing neuroses of the stomach as being second to duodenal dysfunction.

Dr. O. F. Lamson next presented a case of carcinoma of the stomach. This patient was operated on for carcinoma of the stomach, July 14, 1927, after having stomach trouble for eight months and losing thirty pounds of weight. A large carcinoma of the pulorus and pyloric end of the stomach was removed, with several lymph glands which showed metastasis. About a month later he entered the hospital for myocarditis, but this was not severe. In August, 1928, he developed a urinary obstruction and again entered the hospital. After a retention catheter was left in place until the blood chemistry had returned to normal, and the kidney function to a good percentage, a prostatectomy was done. After the operation he developed pyelonephritis, and died on the eleventh day. The autopsy showed a gastrojejunostomy, which resembled very closely a normal pylorus. There was no evidence of cancer about the stomach, nor the lymph glands in the chest or abdomen.

This case was discussed by Dr. D. H. Nickson, with accompanying pathologic specimens of kidneys and stomach.

PIERCE COUNTY MEDICAL SOCIETY

Pres., W. G. Cameron; Secty., W. B. Penney

The regular meeting of the society was held Sept. 25 in the Washington Building. Vice-President D. M. Dayton occupied the chair. Resolutions upon the death of Dr. J. B. McNerthney were read. These had been prepared by a committee consisting of Drs. L. J. Hunt, W. D. Read and H. G. Willard. Dr. H. J. Whitacre presented several cases from United States Veterans' Hospital No. 59.

At the meeting on Oct. 23, Dr. H. G. Willard read a paper on "Empyema in Children." Dr. E. O. Houda discussed "Iodine Surplus and the Ultimate Cause of Goiter."

LEWIS COUNTY MEDICAL SOCIETY

Pres., R. B. Stephenson; Secty., Rush Banks

At a regular meeting of the society held Monday evening, October 8, Dr. E. O. Houda, Tacoma, Wash., read a paper entitled "Iodine Versus the Ultimate Cause of Goiter." An extensive recitation on the subject of goiter was presented. Citation of many authorities, together with a personal interpretation of established facts, was linked up to the results of his own investigations. The ultimate factor was presented as an infection of the gland. His interpretation of facts presented by McClendon, VonFellenberg and Lunde, apparently dissipate the consideration of a basic role played by iodine deficiency as the cause of goiter. Calculations presented showed that a hypothetical diet containing the highest units of iodine supply approximately the small yearly total of 20 mgm. Diets of foods raised in relatively low iodine districts supply more than the hypothetical loss of 1 per cent of thyroxin iodine. The retention of .01 mgm. per day, or 3.65 mgm. per year, is sufficient to maintain a normal gland. Amounts over this daily retention are eliminated. The excretion of iodine is high in nongoiterous regions, because of high intake. The excretion through urine alone in goiterous regions shows figures far in excess of the physiologic needs of the body. The failure of a sufficient daily retention of a part of .02 to .08 mgm. which passes in the urine alone, must be explained upon an incompetency of thyroid cells. The yearly total of .02 to .08 mgm. per day amounts to 7.3 and 29.2 mgm. The last figure is more than the total intake of iodine from the high containing diet mentioned above. The incompetency of thyroid cells is secondary to the bacteria *in situ*. The intimate connection of the goitrigenous or ultimate factor, with the waters of the Pacific Northwest, a virgin country, is by the migration of millions of salmon. All these fish die with infections and decompose in the headwaters of practically every stream. The responses to antigen treatment, both before and after surgical interference, according to Dr. Houda, is too conclusive to leave any doubt upon the ultimate factor causing the disease.

PACIFIC NORTHWEST ORTHOPEDIC ASSOCIATION

Pres., H. J. Wyckoff; Secty., R. L. Jeffery

The Pacific Northwest Orthopedic Association held its fourth annual meeting in Seattle on September 29. Among the out of town members present were Drs. McClure, Akin and Blair of Portland, Ore., Dr. Langworthy of Spokane and Dr. Rich of Tacoma. Drs. Eikenbary, Anderson, Lile, Brugman, Murray, Wyckoff and Jeffery of Seattle were also present.

A very interesting dry clinic was presented at the morning session by several of the Seattle members in the auditorium of the Medical and Dental Building. Adjournment was then made to the Children's Orthopedic Hospital, where a juvenile dry clinic was presented. Luncheon at the hospital was followed by golf at the Broadmoor Golf Club. After a banquet at the club a most instructive two hours was spent in review of interesting and unusual cases.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., E. C. Wheeler; Secty., A. E. Hillis

The regular meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held Tuesday, September 18, 1928, at the Medical and Dental Building, Seattle. In the absence of Dr. E. C. Wheeler, president of the society, Dr. W. O. Bell, the first vice-president, presided.

The resignation of Dr. E. C. Wheeler, president, was read and accepted. A committee, composed of Drs. Washburn, Clark and Waltz, was appointed to write Dr. Wheeler a letter expressing appreciation of the work done in the society and wishes for a speedy recovery from the ill health which necessitates the resignation.

The coming Pacific Coast meeting was discussed by several members, and on motion by Dr. Dowling the secretary was asked to get in touch with the officers of the Coast Society and see if it would not be possible to have the date of the Coast meeting set before or after the Denuer lectures so that the members may attend both without so much traveling and loss of time.

Dr. J. H. Harter gave a resume of his paper on "Operative Cure of Chronic Suppurative Maxillary Sinusitis." The rhinologist should impress the general physician with the frequency of chronic suppurative maxillary sinusitis. These infections should be sought for as are now those of teeth and tonsils. For diagnosis, every routine case should be transilluminated. If suggestive of sinus infection, a series of x-ray pictures should be taken and suspicious antrum irrigated. If diagnosis of chronic disease of the antrum is made and the case does not respond to simple treatment, the Denker operation, under local anesthesia, is favored, for which reasons were given.

Dr. J. T. Dowling read a paper, "Relief of Traumatic Facial Paralysis by Operation." Patient, age 28, male, single, sailor, after a fall Feb. 15, 1928, was unconscious for three days. He had complete right side facial paralysis since date of accident. Was admitted to Virginia Mason Hospital March 10. Physical findings were the complete facial paralysis. In the right external auditory canal was a spicule of bone in the region of the facial canal. Ultraviolet ray treatment gave no improvement.

On May 22, a radical mastoid operation demonstrated fracture through the mastoid bone and confirmed the displacement of the facial canal forward into the external auditory canal. The spicule of bone was removed, the nerve exposed and all pressure released.

Patient discharged from hospital June 13. He has been treated with ultraviolet ray and massage. There has been gradual recovery from mouth upwards, the nose now being almost straight.

Dr. Dowling described suture of Tenon's capsule in enucleation. Patient, Aug. 3, 1928, was struck in left eye with a large hook. Eyeball lacerated through limbus with loss of vitreous. Enucleation Aug. 16. Closure. Tenon's capsule closed with catgut No. 000. Artificial eye inserted Sept. 10.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Clinical Medicine. By Oscar W. Bethea, M.D., Ph.G., F.C.S., F.A.C.P. Professor of Therapeutics, Tulane Graduate School of Medicine; Chief of Medicine, The Baptist Hospital, New Orleans, etc. Octavo Volume, 700 pp. W. B. Saunders Company, Philadelphia and London, 1928. Cloth $7.50.

In the preface the author states that most textbooks on medicine are written about work as accomplished in fully equipped modern hospitals, presupposing that similar work based on all the latest diagnostic facilities may be done by the readers thereof. The writer further postulates that the great majority of patients must be treated in their homes in the absence of most elaborate diagnostic means and, in the writing of this book, he has kept this constantly in mind, with the implied corollary that by appropriate clinical description the diagnosis may be arrived at without special diagnostic appliances. The book covers about one hundred of the most common diseases coming within the province of internal medicine and practically represents lectures given by the author to undergraduate and postgraduate students at Tulane University.

The reviewer is impressed with the therapeutic portions more than the diagnostic sections of the book. The care given patients with lobar pneumonia is sufficient confluence of patches in some area of in-careful nursing rather than specific treatment will no doubt receive the sanction of most clinicians. In the matter of diagnosis of the commonest form of pneumonia, the bronchial type, the text is rather weak. Thus, "the local symptoms as evidenced by chest examinations are largely those of bronchitis, there being scattered rales of various types all over the entire chest. These may be accentuated on one side or in some particular area. In many cases there is sufficient confluence of patches in some areas of involvement for evidence of definite consolidation to be made out, though such are usually small." In most cases of bronchopneumonia, as has been pointed out by Christian and others, there are very definite signs of bronchopneumonia first originating under the angle of one or the other scapula and consisting of showers of moist rales first, followed by a limited area of dullness and increased vocal resonance.

In the differential diagnosis of epidemic encephalitis, tuberculous meningitis and syphilis are noted among the diseases most likely to cause confusion

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but no mention is made at all of the disease most apt to give rise to a mistaken diagnosis, i.e., poliomyelitis. However, in consulting the article on the latter disease it is pointed out that in early stages it may be impossible to differentiate epidemic encephalitis from poliomyelitis. Indeed, in the encephalitic type of poliomyelitis the diagnosis may largely depend on the season of the year as emphasized by Bassoe. He regards doubtful cases of these diseases as poliomyelitis in summer and encephalitis in winter, while in such cases occurring at other times he "throws up his hands."

Eleven pages are devoted to the consideration of gastric ulcer and but one to duodenal ulcer and yet the latter is ten times more common than gastric, according to recent statistics from the Mayo Clinic, and much more suitable for medical treatment owing to its freedom from the danger of malignancy. The incidence "is very much the same as gastric ulcer, with the exception that the condition is more frequent in men," the author states.

Bethea affirms the differential diagnosis of cholecystitis that "it is necessary to differentiate between the presence of gallstones and actual inflammation of the gallbladder. This is done principally by the evidence of inflammation, such as elevated temperature and increased total white and neutrophile counts." It is notoriously impossible to distinguish chronic cholecystitis with stones from that without, unless stones be definitely determined by x-ray and such determination is usually unnecessary. The two to three times greater frequency of gallbladder disease in the female is not noted, and the almost constant presence of cholecystitis in women who have borne more than three children and also the extraordinary incidence of cholecystitis in all adults as compared to all other chronic digestive disorders, amounting to something like 40 per cent, according to Graham, in all adults, are not mentioned in this book.

It would seem to the reviewer that in a work, the chief object of which is to enable the reader to diagnose and treat conditions without all the laboratory aids of the best clinics, every clinical means should be afforded in the way of symptoms, statistical facts as to frequency, age, sex, etc., and diagnostic points especially as to differential diagnosis. Thus, in reference to diagnosis of chronic cholecystitis where large numbers of cases are seen, the chief trouble will be found in the discrimination between this and duodenal ulcer. In this work ulcer is the last disease noted in reference to differential diagnosis and the chief differential diagnostic points are not noted nor the importance of sex. Again, in diagnosis of auricular fibrillation the first thing to be noted, the pulse deficit, is not spoken of.

The idea of a purely clinical work for the general practitioner is a good one, but it should depart wholly from the conventional lines, and the essential clinical features of diagnosis and differential diagnosis as experienced in every day practice should be particularly dwelt upon. Also, common pitfalls should be described, and it should be told how they may either be avoided, or how we may make a reasonably approximate diagnosis, such as 75 per cent cholecystitis and 25 per cent ulcer; or acute suppurative disease of the liver, for example, without going further into the numerous actual possibilities. The present volume is a safe, sound and summarized clinical description of disease according to conventional accepted if somewhat hackneyed lines. WINSLOW.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month). Volume XII, Number 2. (Nebraska University Number, September 1928). Octavo of 254 pages with 40 illustrations. Per clinic year, July, 1928 to May, 1929. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1928.

Most of the subject matter in this number represents the topics of staff clinics held by members of the University of Nebraska College of Medicine. A large number of infectious and metabolic diseases is discussed. Hamilton, writing upon the subject of undernourished children, makes a plea for conservatism in prescribing milk for these patients. He believes that a large daily intake of milk, i. e., a quart or more, often causes a sense of fullness and consequent rejection of solid food. Better results are obtained, he states, by limiting the milk to a pint daily and enlarging the dietary of vegetables and cereals.

EFFECT OF LIQUID PETROLATUM GIVEN BY MOUTH ON DIGESTION AND ABSORPTION OF FOOD. The effect of liquid petrolatum given by mouth on digestion and absorption of food is studied by Alfred B. Olsen, Battle Creek, Mich. (*Journal, A.M.A.*, July 21, 1928). He made researches in dogs and in human beings and gives the results of his experiments. The author concludes that laboratory dogs with one meal a day have only one regular stool daily with an average motility of about eighteen hours. The feces of the dogs unfirmly contained large quantities of hair, which may serve a useful purpose as roughage and may be useful in stimulating peristalic activity of the bowels. The use of muzzles to prevent the eating of the hair not only worried the dogs but also seemed to cause constipation. From the experiments on dogs it would seem that the use of liquid petrolatum given by mouth does not interfere with the digestion or absorption of protein food as judged by the fecal waste of nitrogen. While the students considered their bowel action normal before the experiment, the fact is that all of them had a varying degree of constipation. In most cases the oil encouraged better action and produced softer and more natural stools, although the effect was comparatively mild. The taking of 15 cc. of liquid petrolatum with meals three times a day did not appear to upset, hinder or in any other way interfere with the digestion and absorption of the food as judged by the nitrogen and carbohydrate waste eliminated by the stools, nor did it affect appetite. The amount of nitrogen waste as determined by fecal analysis was not increased when the students were taking liquid petrolatum with each meal, but remained practically the same. What is true of the nitrogenous waste holds also for the carbohydrate elimination. Analysis shows that the amount of reducing substance in the feces is not increased by the taking of liquid petrolatum. The results of both experiments, in dogs and in human beings, indicate that the taking of liquid petrolatum by mouth in therapeutic doses did not interfere with the digestion and absorption of protein and carbohydrate food.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

THE PRESENT STATUS OF THE ADRENAL PROBLEM *

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Among all of the endocrine glands there are none more important than the adrenals. Their extirpation is incompatible with life and various striking clinical syndromes are apparently associated with pathologic changes in their structure or function.

The adrenals are found in most vertebrates. They are not found in some fishes and seem to increase in importance as we ascend the animal scale. In higher vertebrates, the adrenals show distinct division into two parts, cortex and medulla, which are combined as an anatomic unit. These parts are, however, of different embryologic origin, as the cortex is developed from the mesoderm of the genital ridges while the medulla arises from neuroblast masses which give rise to the nerve cells of the sympathetic ganglia. On treatment with chromates the cells of the medulla give a characteristic yellow brown color called the chromaffin reaction. By means of this, masses of cells similar to those of the medulla have been located in other parts of the body. These cells have been found chiefly in small masses along the sympathetic nerves and in the carotid gland. Accessory bodies of cortical structure are also found (interrenal bodies), and cell masses composed of both cortical and medullary substance are not infrequent.

The adrenal has a very rich blood and nerve supply. According to Burton-Opitz and Edwards, the average flow of blood through the adrenals of dogs is approximately five cubic centimeters per minute per gram of gland. This enormous blood supply is undoubtedly of significance in relation to the secretory and possibly other functional activities of the gland. The nerve supply is from the sympathetic system through the splanchnics and also from fibers of the suprarenal plexus. The nerve endings probably directly stimulate the cellular activity.

The study of the function of the adrenals has been undertaken by means of extirpation, mutilation, attempted stimulation, transplantation, and administration of various extracts. Death following extirpation in the earlier experiments was probably due to shock, infection, injury to nervous structures, etc. It is apparently true that many of the earlier workers and some of the more recent ones have been right by mistake when attributing death to suprarenalectomy. The effects of surgical trauma explain many of the results. With improved technic it has been shown that various animals survive extirpation of the glands for varying short periods of time before definite symptoms put in an appearance. Even in animals like guinea pigs and cats, which are practically all destined to die, there are no symptoms or none that are at all marked, from

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the time when the direct effects of the final operation have worn off, until a relatively short time before death. The appetite may be good, the body temperature normal, the muscular activity and strength not sensibly different from that of control animals subjected to a similar operation. This is also true of the rabbits which eventually succumb; nobody could distinguish them from those which are going to survive indefinitely. There may be some loss of weight, but at this stage this is as likely in the one group as in the other. Then comes a change, as often as not, so abrupt that one day the animal may appear to be well, and the next, obviously sinking, and on that day or the following one may be dead.

The first sign is loss of appetite. The rectal temperature will now be found subnormal. Muscular weakness becomes more and more pronounced. Diarrhea is often present. The animal grows rapidly worse. Presently it is unable to stand, the posterior extremities showing pronounced weakness sooner than the anterior. The respiration fails, often while the heart is still beating fairly well, although the blood pressure is diminished. In partial removal of adrenal tissue various results are noted and depend on the total amount of tissue removed and upon whether cortical or medullary tissue remains. Biedl found that if one-eighth of the total adrenal tissue is allowed to remain, the animal will live if the part left were the cortex. He believes that there is sufficient evidence to conclude that extirpation experiments demonstrate that it is the cortical tissue which is essential to life. This view is generally accepted at the present time. It may be noted that extirpation experiments have not succeeded in producing the clinical picture of Addison's disease.

Perhaps the most important problem of the adrenal, therefore, is the problem of the function of the cortex. How it exercises its life saving function is unknown. Two possibilities are self evident. It may form and discharge into the blood stream some substance essential to the maintenance of life and health or it may neutralize or aid in the excretion of toxic substances normally produced elsewhere. The recent experiments of Stewart and Rogoff, Hartman, and others in prolonging the life of adrenalectomized animals by the administration of cortical extracts favors the former hypothesis. That the cortex may have a function, not, however, indispensable to life but related to the activity of the medulla, is perhaps still an open question.

The discovery by Oliver and Schafer in 1894, that extracts of the adrenal medulla cause on injection a marked rise in blood pressure and other pharmacologic effects, attracted the interest of numerous investigators. The observation of Cybulski that the same effects could be produced by the injection of venous blood collected from the adrenals led to the belief by the earlier workers that the adrenals performed an important function by means of this medullary secretion. This was further substantiated by the observations of Dreyer and others that the secretion of the adrenal medulla is under the control of extrinsic nerves.

Regarding the physiologic activity of the adrenal medulla, two general conceptions as to its functions have arisen; the tonus theory and the emergency theory. The tonus theory assumes that there is a steady and constant liberation of epinephrin in small amounts at all times and in all physiologic states and that the quantity thus liberated is sufficient to maintain normal arterial tone by establishing a state of receptivity by the stimulation of the sympathetics. The emergency theory, presented by Cannon in 1914, holds that while the constant secretion may be negligible in effect, under circumstances of great emotional stress, pain, or asphyxia there is a marked augmentation of secretion. This augmentation is of such a degree that effects are produced which muster the resources of the individual in such a way as to best meet the necessities of flight, combat or pursuit. Cannon states: "The cessation of activities of the alimentary canal; the shifting of the blood from the less insistent abdominal viscera to the organs immediately essential to life itself, such as the lungs, the heart, the central nervous system and, at critical moments, the skeletal muscles as well; the increased cardiac vigor; the quick abolition of effects of muscular fatigue, the mobilizing of energy-giving sugar in the circulation—these are the changes which occur when fear or rage or pain causes the suprarenal glands to pour fourth an excessive secretion."

To both of these theories various objections have been raised on the basis of experimental evidence. These various objections may be summarized as follows:

1. Epinephrin secretion from the medulla is not indispensable for life and health. Cats, dogs and monkeys have been shown to live indefinitely in good health after excision of one adrenal and complete enervation of the other, an operation which reduces the output of epinephrin to an

indetectable amount. Such animals soon recover and, if not fully grown, put on weight and behave in all respects, so far as has been observed, like normal animals.

2. Moore and Purinton reported in 1900, that threshold doses of medullary extract when injected intravenously provoke a fall in blood pressure. This was corroborated by Hoskins and McClure in 1912.

3. Hoskins and McClure found in 1912, that the threshold dose with regard to blood pressure effects is two to three times the estimated output of epinephrin by the adrenals and that the minimal dose producing a rise in pressure is ten to twenty times the probable output.

4. In 1912, Hoskins and McClure reported that the quantity of epinephrin in the blood sufficient to raise the blood pressure or to affect the blood pressure is more than sufficient to inhibit the motility of the gastrointestinal tract. This observation tended to render the tonus theory untenable while not affecting the status of the emergency theory.

5. Various experiments by Young and Lehman, Kahn, Hoskins and McClure, Austmann, Holliday and Vincent, tended to show that the sudden withholding of epinephrin secretion by ligature of the adrenal veins is without significant effect upon the blood pressure.

6. Stewart and Rogoff in many experiments designed to estimate the output of epinephrin by the adrenals by assay of adrenal vein blood, failed to find significant increase in output during pain, asphyxia or emotional excitement.

It would carry us too far afield to discuss all of the evidence bearing upon these questions. It will suffice, therefore, to consider only the aspects of these problems upon which recent work has shed some new light.

Cannon and Lyman in 1913 reported that the depression of blood pressure seen with small doses of adrenalin in anesthetized cats is changed to a rise in pressure with the same dose after the animal has been pithed. They attributed this to injury of the sensory nervous system. In 1917, Berry studied the effect of adrenalin injections in dogs and cats under local anesthesia. He reported that depressor responses were but seldom seen in his experience and that general anesthesia with ether markedly decreased the vasomotor response. These experiments have received little subsequent recognition.

In 1926, MacDonald and Schlapp repeated the observations of Cannon and Lyman but offered the suggestion that the depressor response was related to anesthesia. This suggestion received further substantiation by experiments in our laboratory. By the development of a technic, whereby the carotid artery was transplanted externally to the skin at a previous operation, is was possible to obtain accurate blood pressure readings upon a normal unanesthetized and undrugged animal. By this method we were able to determine that the minimal threshold dose of injected epinephrin produces a rise in blood pressure and not a fall. We were also able to show that the minimal effective dose is but slightly larger than the estimated output of the glands. These findings do not prove that normal epinephrin discharge maintains vascular tone, but they afford strong reasons to believe that an augmentation of 50 to 100 per cent in the adrenal output will have definite vasomotor effects.

Similarly we have made comparative studies of the effect of epinephrin on blood pressure and intestinal motility in both the unanesthetized dog and in man and have found the vasomotor system to be more sensitive than gastrointestinal motility. This observation would indicate that, if gastrointestinal inhibition occurring during times of emotional stress is due to epinephrin discharge, coincident vascular effects should also be obtained.

With regard to the various experiments in which the sudden withholding of epinephrin secretion by ligature of the adrenal vein have been proved negative, attention should be called to the fact that these experiments have all been done under conditions of anesthesia. Under these conditions not only does epinephrin when injected in threshold doses produce a fall in pressure but depressor responses may be seen when the epinephrin discharge of the adrenal is augmented by stimulation of the sympathetic nerves. It would not be expected therefore, that withholding the secretion of the adrenals would lead to any significant fall in blood pressure under the conditions of these experiments.

Tournade and Chabrol, and Molinelli have performed experiments in which an anastomosis is made between the lumboadrenal vein of a donor dog and the jugular vein of a second. If the recipient has been adrenalectomized and has a low blood pressure, this pressure will be raised when the adrenal vein blood from the donor is allowed to enter the circulation. They conclude on the basis of their experiments that the epinephrin constantly furnished by the adrenals has a tonic action upon the arterial pressure, the heart and the blood sugar level. This role, however, is much less than that of the nervous system. Inasmuch as their experiments have been open to certain objections such as anesthesia, we have repeated this type of experiment with the recipient dog unanesthetized. Sufficient experiments have not as yet been done to be conclusive, but thus far our results tend to confirm their observations.

In conclusion, attention should be called to the recent work of Britton, Geiling and Calvary at John Hopkins University. Their studies relate primarily to the effect of epinephrin on the carbohydrate metabolism, an influence in harmony with the known effect of the hormone in in mobilizing sugar in the body and promoting calorigenic actions. The experimental results offer proof that in the absence of the normal epinephrin secretion the organism suffers a severe and persistant lowered ability to counteract the effects of minute amounts of insulin. It is further indicated that a highly potent secretion from the suprarenal medulla, tending toward depletion of the hepatic glycogen stores in the body while supplying sugar to the blood stream for use by the muscular and other tissues, takes place during insulin hypoglycemia, and that in the absence of this secretion the glycogen depots, although well furnished, have a much restricted availability to the interdependent parts of the organism. From this it follows that, while life may apparently be normally sustained, as it is well known, after suppression of medulla adrenal activity, under certain critical or emergency conditions a marked incompetence becomes evident. Perhaps medical thought has been too hasty in relegating the suprarenal medulla to a post of functional mediocrity in the body merely because it does not exhibit life-saving properties.

Value of Bronchoscopy in Diagnosis of Malignant Conditions of Lungs. Porter P. Vinson, Herman J. Moersch and B. R. Kirklin, Rochester, Minn. (*Journal A. M. A.*, Nov. 10, 1928), point out the value of bronchoscopy in the diagnosis of malignant conditions of the lungs. Of the twenty-three patients observed previous to Jan. 1, 1928, nineteen are dead, the average duration of life being four and a half months; one patient cannot be traced, and three patients are living and improving under deep roentgen-ray treatment. In early primary carcinoma of the bronchus the roentgenogram shows a typical unilateral hilar density with infiltrating borders definitely centered at the hilum, and an atelectatic or occasionally a bronchiectatic appearance due to bronchostenosis. The presence of one or both of these phenomena is sufficient evidence on which to recommend a bronchoscopic examination. Malignant lesions are common in the tracheobronchial tree. The chief symptoms are cough, expectoration, hemoptysis, loss of weight, dyspnea, pain in the chest, fever and hoarseness. The most common manifestation is evidence of partial or complete occlusion of bronchus.

PAIN FROM A UROLOGIC STANDPOINT

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In making a diagnosis we depend upon (1) inspection, palpation, percussion, and auscultation. (2) We may also employ any of the special clinical methods to demonstrate the normal from the abnormal function of the various organs. It would be folly for one to limit his observation to either of the two methods. Nor would one be justified in attempting to master all the various technics necessary to prove a given pathologic condition. I am not necessarily interested in the abnormal changes undergone by the biliary tree in the different cirrhoses any more than you would be to know that an increase of the peripheral circulation of the kidney may or may not affect the urinary output. However, we are all interested in the gross differentiation of a pyelitis or ureteritis from appendicitis, salpingitis, cholecystitis, pleuritis, etc. Especially are we interested after we have assured the patient and the relatives that an immediate operation is necessary to prevent a ruptured appendix and, on opening the abdomen, we find a normal appendix with the recurrence of the same pain that the patient experienced before the operation.

Explanation of these so-called referred pains is more or less theoretical. Robertson[1] explains this complex in his article on disturbed reflexes. He states, "Rigidity is a sensory motor reflex, both limbs belong to the somatic nervous system. The afferent is a motor nerve. No rigidity is ever found unless the parietal peritoneum is involved; it matters little whether the area be large or small. The afferent stimulation is through the delicate plexus of sensory nerve fibers lying subendothelially in the parietal peritoneum. Strong sympathetic afferent stimuli from a diseased viscus are not responded to by the contraction of a voluntary muscle; they are responded to by a strong and continued reflex contraction of the plain muscle of the gut. That is the true visceromotor reflex. It is not a sign but a symptom and is expressed by the patient as a sign of a certain character and frequently located far away from the diseased viscus." Continuing, he states, "Visceral abdominal pain is due to vigorous peristalsis of involuntary muscle or contraction of sphincteric areas often at some distance from the point of stimulation. On the other hand, the pain of parietal peritoneal irritation is felt close to the point of irritation and this is coupled with definite though frequently circumscribed areas of muscular rigidity."

This, I believe, offers the explanation why we do not have standardized pain in any one given pathologic condition. Ureteral pain might be referred in just the same manner. As an example, a highly inflamed ureter or a perinephritic abscess, by contiguity may give peritoneal inflammation over any loop of gut that may be in proximity. Consider in the pathologic state the approximation of the diseased gallbladder to an inflamed kidney pelvis, or of a retrocecal appendix to the ureter, or again of the fallopian tube to the ureter. The same area of parietal peritoneum may be irritated by one or the other of these organs.

Not long ago I saw a man with a large subacutely inflamed kidney who complained of indigestion and offered this as the one and only subjective symptom. At no time had he ever had pain through the lumbar region or the lower abdomen. The kidney had enlarged to such an extent that the upper pole evidently interfered with the proper functioning of the pyloric end of the stomach. At any rate nephrectomy relieved him of the gastric disturbances. This same individual had had his urine examined at various times with negative reports.

Frequently we have examined urine in confirmed cases of ureteritis and pyelitis and have obtained practically a normal result. Yet ureteral catheterization has given prompt relief. Hugh Young[2] explains this by offering the work of Sweet, Stewart and Eisendrath. "In chronic ureteritis they published pictures showing the lymphatic spaces to be packed with leukocytes. The wall of the ureter is involved, leaving the mucosa practically undisturbed. Neither will there be desquamation of mucosa or outpouring of leukocytes into the ureteral lumen, and normal urine will be found in the bladder when the ureter is completely blocked as a result of an acute inflammatory process. In acute pyelitis and ureteritis, where the urine is passing from the affected side, there naturally is an increase of leukocytes and desquamation of epithelium."

The subjective symptoms in chronic ureteritis and pyelitis are due to the temporary blocking of the flow of the urine from the kidney pelvis. Catheterization of the ureter relieves the pressure and gives prompt relief. This relief in itself is partially diagnostic, where there is some doubt as to whether the condition is due to the kidney or to some other organ. Where there is doubt, rarely is the patient's condition such that cystoscopy will not be permitted.

It is true that many cases are suspected of having kidney pathology when routine examination will show that the trouble is elsewhere. I believe that the report of the cases cited below will remind us of the possibilities in referred pain. The pain in pyelitis and ureteritis like appendicitis may not be typical.

A very brief review of these cases is here given with no attempt to detail the physical findings other than to give the subjective findings. These demonstrate how often we may be deceived by pain.

CASE REPORTS

Case 1. Mr. M. R. B., age 27. Complaint: stomach trouble, extending over a period of two years. An indefinite dull pain over McBurney's point. Has had three gastrointestinal examinations elsewhere. Pain persisted following exploration and appendectomy. Finally classed as a neurasthenic.

Diagnosis: Pyelonephritis and ureteritis, organism undetermined. Complete relief after kidney lavages.

Case 2. Mr. J. P., age 22. Pleuritis pain in right chest; unable to take deep breath. Chest normal on examination.

Diagnosis: Pyelonephritis, right side, due to colon bacillus. Complete relief after lavage of kidney and treatment.

Case 3. Mrs. M. B., age 40. Admitted to hospital complaining of severe abdominal cramps, nausea and vomiting. Pain more noticeable on the left side than on the right. Urine negative other than slight trace of albumin.

Diagnosis: Right pyelonephritis, due to the colon bacillus. Complete relief after repeated kidney lavages.

Case 4. Mrs. A. L., age 26. This patient was taken from one of the night trains, suffering from sudden and acute pain in the right lower quadrant, with tenderness and some rigidity. Bimanual examination revealed an apparent mass in the region of the right fallopian tube. A laparotomy was performed and the fallopian tubes were found to be normal. In fact, no pathology in the abdomen could be noted.

Diagnosis: Right pyelonephritis, ureteritis, ulceration around the right ureteral orifice. The right ureter was very much thickened. On palpation it seemed as large as the little finger.

Case 5. Miss E. L., age 28. Complaint: Cramps in the abdomen, starting at night and continuing in severity; on the following day she was slightly nauseated. Vomited about four hours before consulting a doctor. Cramps began in region of appendix and were referred to back. Operated on elsewhere, abdominal contents examined throughout for source of trouble, but none was found.

Diagnosis: Subacute right pyelonephritis. Chronic ureteritis. The urine showed a slight trace of albumin on three different occasions. Microscopic examination of urine: Occasional epithelial and pus cells.

Case 6. Miss H. M., age 14. Working diagnosis: Influenza. No particular pain. Felt tired out, but had a temperature that ranged upward to 103°. Final diagnosis: Bilateral pyelitis. Temperature receded after kidney lavages.

Case 7. Mr. Mc., age 45. Under observation at the present time. Admitted to hospital to be operated on for appendicitis. The surgeon refused to operate until the posibility of a kidney involvement was ruled out. He complains of pain in the right lower quadrant. On palpation there is rigidity and tenderness in the right lower quadrant. Ureterogram and pyelogram show a marked narrowing at the uterovesicle junction with a beginning hydroureter and a chronic pyelitis. The pain complained of can be reproduced on ureteral catheterization and slight inflation of the right kidney pelvis.

SUMMARY

Seven cases are cited, simulating to a certain extent (1) stomach trouble, (2) pleurisy, (3) gastrointestinal diseases, (4) salpingitis, (5) appendicitis, (6) influenza.

I mention the last case because there is some question as to the possibility of a chronic appendicitis complicating the kidney condition. The white blood count in this case has remained low since the patient left the hospital.

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PAIN IN THE BACK *

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The literature on the subject of back pain is voluminous. It would seem that the facts were all before us, that the last word had been said, but as the medical profession has been collecting this mass of literature, a whole system of quackery has grown up, paying its office rent by treating our mistakes. It is all very well to take these manipulative cures cum grano salis; the fact remains, nevertheless, we are the ones who probably had the opportunity and did not cure the patient first. This, then, is my apology for presenting again a much overdone and to many a very uninteresting subject.

When a patient presents himself for relief of any ailment it is customary to make a diagnosis. This custom should be followed when back pain is the disability complained of. If care is taken and ordinary diagnostic aids are used, a definite clinical entity may be evolved from the one symptom of pain. It is easier and certainly more scientific to treat sacroiliac disease, or spinal arthritis, or tuberculosis of the spine, than to call it back pain and treat it as such. The radiogram without any question is our most important help. It is admitted that used routinely it is often negative but even this negativity is of assistance in coming to a proper conclusion. Lateral views of the spine should always be taken. Small films taken in stereo over localized areas will show bone detail otherwise unobtainable.

General conditions causing backache are many, asthenic conditions probably playing the most important role. Back pain in diabetes and in hyperthyroidism is common. Toxemias of all kinds should be considered. Infection in any part of the body causes pain either by general muscle debility or by direct infection of local tissues. The pain in backache due to general causes is usually an aching type, located in the lumbar region. If it is localized it is distributed over quite a large area. There is no limitation of movement. It is cured, of course, by removal of tonsils, control of the diabetes, etc.

Belonging to this type of pain is the backache due to gynecologic and genitourinary conditions. It is the same indefinite pain, more severe when the patient is fatigued, never sharp in character, never limiting the normal movements of the spine. Fifteen per cent of back pain in women is said to be due to disorders of ovarian, tubal or uterine orgin. It is well to remember that uterine displacement probably plays a small part in this series, and infections of cervix and tubes a great one. In the male, seminal vesiculitis is often overlooked. With a negative radiogram and no limitation of motion in the normal movements of the spine and back, the presence of pelvic inflammation, either male or female, is certainly to be considered as a cause of the aching back.

Spinal arthritis with its associated radiculitis is the most common of all spinal disease. It attacks insidiously and presents a varied symptom complex. It may localize itself to a few isolated vertebrae or begin as an acute sacroiliac arthritis and extend rapidly or slowly the entire length of the spine. A stiff neck may be the first sign, or the first radiogram may show almost complete fusion of all vertebræ. It is the cause of a catch in the back. The bone deposit, as shown in the radiogram, is not proportionate to the amount of pain. Some of the worst cases show very little calcification for years. Spinal arthritis in young adults, mostly males, may show only obliteration of the lateral articulations. This at times is like an acute disease; deformity develops quickly and flexion of the spine is severe.

The indications in this type of back pain are, first, the relief of pain; second, removal of cause, usually infection; and last, but just as important, the prevention and correction of deformity. Rest and physiotherapy will stop pain. Local strapping, light braces, recumbency on a board bed or convex stretcher frame will provide ample rest. Removal of all possible foci of infection should be done at once. A careful examination not only of the teeth

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and tonsils, but the paranasal sinuses, gallbladder, cervix, prostate or seminal vesicles may reveal the underyling cause.

When the condition is chronic and movement is impaired or painful, mobilization of the back with the aid of an anesthetic is sometimes advisable. Care must be taken in the type of case selected for this procedure. Exposure of the whole body to sunshine is a valuable adjunct to other curative agents. Spinal arthritis is always accompanied by impaired movement, localized pain, and pain along the nerve radicals emerging from the diseased areas. The common examples of this affection are brachial, intercostal and sciatic neuritis.

Injury, of course, is easy to diagnose, especially if severe, but time brings forgetfulness and often falls which have caused a day or two in bed are not mentioned in history taking. We are surprised at times to find very severe fractures and dislocations, which have been only suspected, when proved by the x-ray. Localized pain usually means localized pathology, and it is wise to persist in x-ray taking until a first class picture is obtained. A small 10x12 film, taken over a few vertebrae in stereo, will reveal bone detail otherwise not seen. Fracture of the whole body of a vertebra will often not be seen in an anteroposterior view.

The vulnerable point of the spine is the fifth lumbar vertebra. Small fractures involving the pedicles, laminæ and lateral articulations are hard to bring out in the x-ray film. Forward slipping of the fifth lumbar vertebra, called spondylolisthesis, is due to fracture or dislocation in these small articulations. This displacement is seen only in lateral views.

Treatment of back injuries consists of rest in a position to prevent deformity. If it is in the lumbar region, the normal lumbar lordosis must be preserved if future disability is not to result. If the patient is in bed, the bed should be hard, made so by boards between the mattress and springs. A soft bed produces kyphoses and is inimical to a permanent cure. Oftentimes a brace or a plaster jacket will suffice. In more severe cases fusion of several adjacent vertebrae is necessary. This is accomplished either by the Albee inlay graft, or perhaps better by the Hibb fusion. Most minor injuries are relieved of symptoms without operative interference. Compression fractures of the vertebral body or marked displacement are cured only by operative interference. Results of these operations are excellent, but must be followed by at least six months of proper support, a body cast for three months, then a light brace.

In the consideration of postural back pain we will exclude those in which local disease of the spine is the cause of the deformity and in which movement of the spine is free. The normal dorsal kyphosis is increased, there may be pain at the apex of the dorsal curve along the intraspinous ligaments, and lumbar lordosis may be markedly increased or the back may be flattened out and the normal anterior curve entirely obliterated.

These are compensatory changes and we must look for the basic reason for this change. A general muscular weakness may be to blame. This type of back is the flat type with obliteration of the lumbar curve. Weak, abducted or flat feet may be the cause. A pendulous abdomen changes the center of gravity, tilts the body backward, and as a consequence the normal spinal curves are changed. Severe operations, sickness causing long recumbency result in postural deformity when ambulation is begun. Foot strain and weakness of abdominal muscles combine to place an added strain on the already weakened erectospinæ muscles. This type of postural backache is the kind the patient thinks the operation or the sickness caused.

Feet should be properly shod and flat feet corrected. Pendulous abdomens should be reduced by diet or supported by corsets.

Inequality in the lengths of the legs causes tipping of the pelvis and a consequent strain, mostly on the lumbosacral segment. The pain is usually felt at the lumbosacral angle on the short side. Compensating the shortness by lifting the heel of the shoe balances the pelvis and reduces the pain. This condition is common and is due to congenital shortness or disease of the lower extremity epiphyses during growth period. At times it is present following fractures with more than a half inch shortening.

Sacroiliac disease and injury is not as common as it was once supposed. I have never seen the so-called slipping of this joint demonstrated in a radiogram. Pain over the back of the sacrum and in the lumbosacral angle are not symptomatic of this disability, and lateral pressure of the pelvis is not usually painful. It is, however, often associated with interference of straight leg raising. Pain occurs on pressure at the sciatic point, located at the lower border of the sacroiliac joint, at which point the sciatic nerve emerges from the pelvis. The cross leg test of Smith-Peterson is almost an unfailing sign.

Sacroiliac luxation is a common cause of backache in pregnant women. It usually occurs after the sixth month, disappears immediately after parturition and appears again two or three months afterward. It is supposed to be due to softening and stretching of the pubic ligaments.

Treatment of sacroiliac pain depends on the severity of the symptoms. For milder types adhesive strapping will be sufficient, and this might be looked upon as therapeutic test of diagnosis. Most cases are at least relieved by this procedure. In other cases the ordinary commercial sacroiliac belt will do. In the more severe types rest on a hard bed with a lumbar roll will be necessary to bring about relief. Others, mostly of the chronic type, require manipulation to break up adhesions.

THE NEPHRITIS OF EARLY SYPHILIS

A CASE REPORT*

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Acute nephritis, associated with the manifestations of secondary syphilis, is a complication only occasionally seen and not infrequently undiagnosed. It is said to occur in about 3.5 per cent of all such cases. However, in large clinics where perhaps several hundred cases of secondary spyhilis are treated annually, rarely more than one or two cases present themselves.

Clinically it is characterized by the sudden onset of the classical signs and symptoms of an acute nephritis; namely, edema, visual and gastrointestinal disturbances, headache, malaise and marked urinary changes. The latter are those of an acute toxic nephritis and are essentially similar to the changes found in scarlet fever or any other severe infection. In acute syphilitic nephritis there is a moderate oliguria which may even progress to a complete anuria. The specific gravity of the urine is usually well above 1,020. The albumin content is very high, perhaps greater than that found in any other form of acute nephritis, so that the specimen boils almost solid. This is the most characteristic finding present. The sediment contains a moderate number of cellular and granular casts, as well as a few red and white blood cells.

The pathologic picture is precisely the same as that found in the other viscera which are so frequently attacked during the exanthematous stage. Among those commonly involved are the heart, liver and spleen, as well as the meninges, the gastrointestinal tract and even the bladder. These other phenomena of early syphilis, the exanthemata, while not so frequently recognized as the cutaneous manifestations, are nevertheless an integral part of the general sepsis taking place at that time.

Unrecognized and untreated the nephritis of early syphilis may terminate in uremia, coma and death. Under proper therapy instituted early, the patient invariably makes a rapid and uneventful recovery. Because of its rarity, and also to show the specificity of arsphenamine therapy, the following case, recently studied, is presented.

CASE HISTORY

The patient, a young woman of twenty-one years, presented herself with the chief complaint of "swelling of the face, feet and hands and difficult breathing." Her present illness began three days prior to entrance. At that time she first began to notice a gradually increasing puffiness of the face, especially of the eyelids, a moderate pallor of the skin, weakness, and attacks of vomiting. She stated that she was short of breath on the least exertion. She also noticed that her urinary output had been steadily decreasing for three days and that the urine was dark in color. There had, however, been no burning or pain. There had been no visual disturbance. She had also noted a faint asymptomatic body rash for some days, and she stated that her hair was beginning to "thin out." Subsequent questioning of the patient brought out the fact that she had been taking douches for about a week for a Neisserian infection, using a medicament supplied by a friend. The exact composition of this drug was not known, but the patient stated it was of a brown color.

The family history was entirely negative.

The past history was unimportant, except that she was delivered of a full term normal baby five months before, and the pregnancy was an uneventful one. Examination of the maternity records corroborated her statements and showed that the blood Wassermann test on both the mother and the child was negative at that time. In addition, it was found that the patient's blood pressure readings and frequent urinalyses were entirely normal, both before and after delivery. These data are of considerable importance in view of the subsequent findings.

Physical examination revealed a well developed, well nourished young woman who did not appear acutely ill. The face showed generalized, diffuse puffiness with a marked edema of both the upper and lower eyelids. There was a noticeable pallor of the skin and mucous membranes. The scalp showed a questionable patchy loss of hair. The entire cutaneous envelope, except the palms and soles, was involved in a maculopapular secondary luetic eruption. Examination of the genitalia showed the presence of condylomata lata. There was a moderate fetor oris with some pyorrhea. The heart was not enlarged. The vascular system was apparently normal and the blood pressure was 112/70. The spleen and liver were not felt. The legs showed a bilateral symmetrical pitting edema, most marked about the ankles.

Examination of a single uncatheterized specimen revealed a urine that boiled almost solid, a moderate number of hyalin and cellular casts, together with many white blood cells and a few red blood cells. A diagnosis of acute nephritis probably specific in origin was made and the patient was admitted to the hospital. She was immediately placed upon the routine treatment for acute nephritis.

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Subsequent course: She continued to show a four plus albuminuria for three days with a gradually progressing oliguria. During this time her blood nonprotein nitrogen was returned 34.8 mmg. per 100 c.c. and 25.5 mmg. three days later. A renal function test showed an excretion of phenolsulphonephthalein, 15 per cent the first hour, 12 per cent the second, a total excretion of 27 per cent in two hours. A concentration test on the urine showed an ability in the kidneys to concentrate to a specific gravity of 1,020 under a restricted fluid intake. The blood count showed 80 per cent hemoglobin, 5,040,000 red blood cells, 8,200 white blood cells, and a normal differential smear. The blood pressure was never elevated above normal. Examination of the ocular fundi showed an early neuroretinitis with a slight central choroiditis. The blood Wassermann test was returned four plus positive. A diagnosis of acute syphilitic nephritis was made and the immediate institution of antiluetic therapy advised.

She received at her first treatment, an intravenous injection of .3 grams neoarsphenamine. The following morning, the urine showed only a one plus albumen content, and an occasional hyalin and granular cast. She received two subsequent intravenous injections of .5 and .7 grams at three day intervals. During this time the edema was rapidly disappearing and the total urinary output increasing. Within ten days after the first injection of neoarsphenamine the albuminuria had entirely disappeared and the urine returned to normal.

Following these treatments a blood nonprotein nitrogen was returned 27.2 mmg. per 100 c.c. The renal function dye test showed an excretion of 25 per cent the first hour, 15 per cent the second, a total of 40 per cent in two hours. Reexamination of the eye grounds showed normal ocular fundi.

The patient continued to make a rapid and complete symptomatic recovery.

DISCUSSION

This patient presented a very interesting diagnostic and therapeutic problem. Inasmuch as the type of treatment to be used depended largely upon the etiology of the nephritis, the importance of establishing the latter was obvious. There were three possibilities to consider:

1. That the patient was suffering from a chronic nephritis. This was ruled out by the following factors: The acute onset, the absence of anemia as shown by the normal blood picture, the normal blood pressure, the absence of cardiac enlargement, the ability of the kidneys to concentrate urine to 1,020, the diminished urinary output and, lastly, by the character of the findings on examination of the urine.

2. A second consideration was that the patient might have an acute exacerbation of preexisting, perhaps latent, chronic nephritis. Against this was the authenticated report that she had only a few months before passed through a normal pregnancy without evidence of any impairment of kidney function. Had there been marked kidney damage prior to that time, one might reasonably expect it to have become manifest under the extrastrain thrown upon the excretory organs by such a process.

3. The last probability was that the patient was suffering from an acute nephritis, either toxic or bacteriologic in origin. Because it was elicited in the history that the patient had been using a vaginal douche, the possibility of an acute mercurial intoxication was entertained. The fetor oris and slight gingivitis found on physical examination of the patient were presumptive evidence in its favor. However, the character of the urinary findings ruled against this, for in cases of acute mercurial nephritis examination of the urine reveals only a slight to moderate albumin content with a marked preponderance of casts of all varieties, thus showing that the pathologic process is essentially a necrosis of tubular epithelium. Subsequent inspection of the medicament proved it to be potassium permanganate and not bichloride of mercury.

Careful examination of the patient failed to reveal a possible focus in the teeth, tonsils or sinuses, which might serve as the portal of entry for a streptococcic infection.

Therefore, by a process of exclusion, in the presence of an active secondary luetic infection, and because of the typical urinary findings, a diagnosis of acute syphilitic nephritis was made. The subsequent course of the process under antiluetic therapy confirmed the diagnosis.

Body Fluid Changes Due to Upper Intestinal Obstruction. Monroe A. McIver and James L. Gamble, Boston (*Journal A. M. A.*, Nov. 24, 1928), conclude from their observations from the study of body fluid changes due to upper intestinal obstruction that a continued loss of digestive secretions causes a rapid withdrawal of fixed base (chiefly sodium) and of chloride ion from the body, which is accompanied by a correspondingly extensive reduction in the volume of the blood plasma and of the interstitial fluids. There also occurs, depending on the relative amounts of sodium and of chloride ion lost, an alkalosis or an acidosis of varying degree. Continued reduction of the volume of the plasma and of the interstitial fluids must increasingly interfere with tissue respiration and with the transport of nutrient and of effete materials. Perhaps the most persuasive evidence that dehydration can be a directly fatal condition is the fact that death can be prevented and characteristic antecedent symptoms removed if the dehydration is adequately repaired by the subcutaneous administration of sufficient quantities of the lost material in the form of physiologic solution of sodium chloride. They regard the fatal effects of loss of the digestive secretions such as occurs in simple pyloric or upper intestinal blockage as the result of extensive withdrawal of inorganic substances, chiefly sodium and chloride ion, from the blood plasma and the interstitial body fluids.

PROSTATECTOMY

PERINEAL VERSUS SUPRAPUBIC ROUTE *

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Prostatectomy has undergone the most radical changes within the last thirty years and the mortality, in consequence of the operation, has been reduced from 30 to 35 per cent down to as low as one per cent or even lower. Various operators have had long series without any mortality at all.

The patients who present themselves for prostatectomy are usually old men, most of them being more than sixty-five years of age and are most always veritable pathologic museums, presenting, as a rule, a multiplicity of pathology. Not only is there found a large amount of residual urine in most cases, but by reason of backpressure the kidneys are also involved in the great majority. Under such conditions prostatectomies were formerly performed, until the surgeons began to realize that these very conditions were responsible for the high mortality.

Then efforts were begun through preliminary treatments to put the patient into a better condition, make him a better surgical risk, and lower the mortality. As early as 1898 Young realized that only through a preliminary care of the patient, putting him into as nearly a normal condition as possible, could he be taken through the operation with any hope of safety. He tried the "phlorizin" test and the "freezing point" test but found them both unreliable and, therefore, unsatisfactory and of very little assistance in determining the improvement of the kidneys in the cases.

Rountree presented an experiment upon a dog before the Interurban Surgical Society in 1909, following the work of Abel, demonstrating the selective action of the kidneys in the elimination of phenolsulphonephthalein. He brought one ureter through the skin of the abdomen so as to be able to study the urine separately and injected the corresponding renal artery with chemicals, in order to produce nephritis. Following this he made intramuscular injections of phenolsulphonephthalein, collected with a catheter in the bladder the urine from the normal kidney and separately the urine from the other ureter externally. Comparing the two specimens, he found that the secretion of phenolsulphonephthalein was greater from the supposedly diseased kidney, which had been injected with irritating chemicals, than it was from the healthy one.

The inference was then drawn that the diseased kidney secreted more phenolsulphonephthalein than the healthy one. However, Young happened to have a patient, in whom one ureter had external drainage and on whom he tried the phenolsulphonephthalein test. This, contrary to the test on the dog with artificially produced nephritis, showed that the drug was eliminated in large quantities from the healthy and *not* from the diseased kidney.

After this basal work Geraghty and Rountree standardized the test and this has been followed and used by practically every surgeon in these respective cases ever since. From this time on (quoting from Young) the test has been used routinely in most cases upon admission to the hospital and again before operation. The patients are given a thorough preliminary treatment of continuous urethral catheter drainage and forced water by mouth or, if found necessary, infusions subcutaneously, and operation was not undertaken, with very few exceptions, until return of phthalein was well above 40 per cent.

In addition to the phthalein test Young began in 1913 to use blood urea estimations in cases with low phthalein output and in those cases, employing continuous catheter drainage, brought the blood urea down to practically normal (0.3-0.5 per liter). The average length of treatment was thirty-nine days.

A high amount of residual urine usually produces badly impaired kidneys, which can always be elicited by the phthalein and blood tests. Under continuous drainage and very large quantities of water, given by mouth, subcutaneously, intravenously or by proctoclysis patients all improve sufficiently so that they can go through an operation quite successfully. Young summarizes the situation thus:

1. The renal impairment is in proportion (approximately) to the amount of backpressure, produced by the residual urine.

2. This backpressure is in sequence followed by dilatation of ureter, pelvis and calyces and the thinning of the renal cortex.

3. This is greatest in patients with large amounts of residual urine who have never been catheterized, but not so great, if they have led even only an intermittent catheter life.

4. Occasionally even a comparatively small quantity of residual urine may injure the kidneys.

5. Infection and vesical calculus may induce or add to backpressure and in that way accelerate the damage to the kidneys, but the use of large quan-

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tities of water with which the kidneys are literally washed out will produce a lowering of the blood urea and an increase in the elimination of the phthalein.

Bumpus, in a paper read at the Clinical Congress of the American College of Surgeons at Philadelphia on October 26, 1925, lays particular stress upon the fact that great caution must be exercised in the withdrawal of urine from the bladder of patients who have had much residual urine. He warns against the sudden withdrawal of even small quantities from such patients and advocates the use of procedure as instituted by VanZwaluwenburg, who attaches the urethral catheter to a long tube filled with fluid, and empties into an elevated receptacle at the foot of the bed, determining the height of the receptacle by the pressure within the bladder, and as this gradually diminishes, the receptacle is lowered. This, as a rule, takes three to four days for complete emptying. Following this, large amounts of water are introduced by the various channels, as indicated above, and this water is then again eliminated by diuresis, purgation or sweating. A careful record of intake and output must be kept. There may be hemorrhage after catheterization. This is so seldom that it is quite negligible, but it does occur.

It is remarkable how patients with high blood urea and low phthalein output can be put into better condition and after a shorter or longer time of drastic preliminary treatment can be improved so much that prostatectomy, performed under gas or epidural anesthesia, can be successfully carried out. As Young says, this is one of the triumphs of modern medicine.

One of the most dreaded complications which is met with in this class of cases and which at times is very difficult to combat, if not impossible to prevent, and which is responsible for a large percentage of mortality, is infection. It is not often that patients come to the surgeon with a history of no or only a small amount of residual urine. Most always they have led more or less of a catheter life and under such conditions cystitis is most always present, from a mild to a severe type, the mild showing as a rule only colon bacilli, while in the severe cases with a large amount of staphylococci, and only rarely streptococci are found. Should the infection have extended to the prostate and seminal vesicles, we may find an abscess present. In case the infection extends transvesicularly and ascends the ureter, then a pyelitis or pyelonephritis will appear as a serious complication. But catheterization is not alone responsible for infection, for this is often found, where there is a large amount of residual urine. Again, it may not extend up to the kidneys, but descend to the epididymis and then epididymitis forms a very annoying complication.

There are two ways in which drainage can be instituted, if such becomes necessary. Whenever the phthalein return is below 50 per cent or whenever the residual urine is high or whenever the patient is much below normal, then a permanent catheter is placed into the urethra and the bladder is irrigated mornings and evenings with a mild antiseptic solution. In case of vesical calculus it is preferable to drain suprapubically. This also must be done for intolerance of the catheter in the urethra or with irritable bladder. However, where there is a large amount of residual urine or where there is a low phthalein output, suprapubic drainage is contraindicated. Besides it has a mortality of its own of over two per cent.

Of complications in patients with enlarged prostates, of particular interest to the surgeon are respiratory infections, diseases of the cardiovascular system, diabetes and acidosis. Infections of the air passages are of the utmost importance and no operation should be undertaken until these are cleared up. If there is a chronic infection of a rather mild type, the surgeon can proceed under gas and oxygen anesthesia or, if a perineal operation is had, under epidural anesthesia. It is to be remembered that in all operations below the umbilicus pulmonary embolism is often responsible for the loss of a case and this must always be borne in mind.

Most if not all of the patients requiring prostatectomy being old men, it is not to be wondered at that arteriosclerosis is most always found. Also, there is a well known cardiorenal interdependence and, if the phthalein output is below 50 per cent, this is the first thing to be thought of and high blood pressure always acts as an indicator. These patients must undergo a prolonged preliminary appropriate treatment and every effort must be made to bring the blood pressure down. This class of patients seems to do best under ether anesthesia, as this is an excellent heart stimulant, and the blood pressure seems to be least affected by it. A diabetic, if of mild type, must undergo an antidiabetic treatment and must not come to the table until the blood sugar is low enough to be negligible. If this is above 2 per cent, the patient must be given very energetic and prolonged treatment before he is ready for operation, and he requires very close attention and very skilled handling after operation. In coming to the operation itself it is necessary, particularly in the perineal operation, that the surgeon be thoroughly familiar with the anatomy in all its details.

A part of the high mortality percentage which formerly prevailed in prostatectomy was due to general anesthesia, mostly ether which in many cases was followed by pneumonia. If it is taken into consideration that almost all patients, coming to the operating table for the removal of the prostate, have bronchitis of more or less long standing, or emphysema or both, it is a wonder that any of them survived. The surgeons who did the majority of prostatectomies soon realized that, if they wanted to reduce the high mortality rate, they would not only have to take the patient through a rational preliminary treatment, but they would also have to employ other than inhalation anesthesia.

The resume of many experiments with various means of regional anesthesia seems to be today that an epidural anesthesia in the perineal and a sacral anesthesia in the suprapubic operation is the best in the great majority of cases. The anatomic arrangement of the nerves supplying the prostate and contiguous structures is such that all may be blocked by a single injection of the anesthetizing solution into the extradural space through the sacral hiatus. As a consequence of a long number of experiments on cadavers by Thompson, Brenner, Shaw and others, it was found that the amount of anesthetizing fluid (3 per cent procain) should not be over 15 to 20 c.c. Reactions of a more or less severe, at times even an alarming, type may appear during or right after injection, but these usually pass off within five or ten minutes. The blood pressure is the best indicator in such cases. To overcome a rapid fall of blood-pressure, 5 mm. of a 1 to 1000 solution of adrenalin, given intramuscularly, will usually effect a rise. If need be, the injection can be repeated in five minutes. Adrenalin is an ideal remedy for this condition. It must be noted that, if there is complete absence of anesthesia after twenty minutes, it is sure proof that the solution was not properly placed.

It is the experience of those surgeons employing epidural anesthesia that the incidence of postoperative complications is definitely less than after any other form of regional or general anesthesia. There is usually no pneumonia, no uremia. Nausea and vomiting and postoperative distension of the abdomen are extremely rare.

Indications and contraindications. The fact must not be lost sight of that regional anesthesia cannot be given to all patients. Extremely nervous or apprehensive patients or those who insist upon a general are unsuitable for a regional anesthesia. An unfavorable mental attitude on the part of the patient constitutes the chief contraindication.

Advantages of epidural anesthesia. Extradural anesthesia produces complete relaxation of the muscles of the perineum. This facilitates the operation and allows a more complete exposure. As a result, the operation can nearly always be done under sight. The congestion and bleeding frequently observed as a result of increased blood pressure associated with general anesthesia is absent. This is conducive to a better view of the operative field.

The patient is spared the postoperative nausea and vomiting and most of the other immediate disagreeable sequellae of a general anesthesia. A full diet may be resumed shortly after operation, a factor of importance in undernourished, rundown patients. Fluids may be taken immediately after operation, making unnecessary the subpectoral infusion so disagreeable to the patient. Postoperative gastrointestinal complications, such as abdominal distension, practically never occur. The incidence of cardiorespiratory complications is materially reduced. In toto, with the use of epidural anesthesia the general body functions suffer a minimum of disturbance from the strain of operation.

Technic of perineal prostatectomy. Through an inverted U incision the prostate is reached by blunt dissection on each side of the central tendon, opening up the space behind the transversus perinei muscle and triangular ligament. After division of the central tendon and rectourethralis muscle the posterior surface of the fascia of Denonvilliers is exposed. Division of the posterior layer of this fascia gives entrance into the space between the two, which is fetal life was peritoneum, and opens up a ready access to the prostate, seminal vesicles and vasa deferentia. By means of the prostatic tractor, introduced through the posterior part of the membranous urethra, the hypertrophied mass can be drawn down into the field.

The urethra is opened by means of an inverted V incision, which makes it possible to ennucleate in one piece the entire adenomatous hypertrophy, including the anterior commisure, if it is involved. With the tractor held vertically, beak directed downward, the lateral lobes having been freed, the mucous membrane in front of the middle lobe is being divided transversely with the scalpel, exposing the ejaculatory ducts, covered by index finger which pushes them back.

This procedure preserves the ejaculatory ducts and gives a chance to remove every vestige of the hypertrophied tissue without injury to the neck of the bladder and internal sphincter. It also makes it possible to follow the hypertrophied tissue beneath the trigone and remove a group of glands, which when hypertrophied are usually not removed by the suprapubic operation and remain to give trouble with future obstruction.

The technic of suprapubic prostatectomy is very simple. The bladder is approached through the preperitoneal space, opened and held apart by retractors. The prostate will come at once into view, particularly if its hypertrophy is more pronounced in the median lobe. With a pair of curved scissors the bladder membrane around the base is cut through and not as formerly torn through with the finger, since this leaves a very ragged wound. The prostate is delivered and removed. A Pilcher bag is placed into the bed of the removed prostate to stop immediate and delayed hemorrhage. This is removed in between six and twelve hours. Before removal it is best to leave it deflated in situ for a few hours and observe the wound carefully to detect delayed bleeding. A reinflation of the bag is necessary in only a very low percentage of cases. In all other cases the suprapubic drainage tube and bag are removed within twenty-four hours after operation. A urethral catheter is placed and maintained for from twelve to fifteen days, after which voluntary urination is in most cases restored without suprapubic leakage.

The postoperative treatment is principally the care-taking of complications as they arise. Of these our first attention is given to shock, since most patients are old, over seventy years and feeble. They must be given water in large quantities up to the time they are taken into the operating room, for this helps them against the loss of blood. However, a quick, careful operation and painstaking hemostasis are required to lessen shock. It is here that the perineal operation has its superiority, since in this there is an easy access to all bleeding points and in that way hemorrhage can be thoroughly controlled. Every bleeding point, if possible, must be secured and the cavity left after enucleation must be most carefully and thoroughly packed with gauze. Even then, with the most careful attention given to it, hemorrhage at times cannot be stopped.

Next in order are pulmonary complications, primarily pneumonia. Since the application of local anesthesia, either sacral in suprapubic or epidural in perineal prostatectomy, this complication is met with much less frequently and this has tended in a remarkable degree to lessen the percentage of mortality. However, pneumonia may develop two or three weeks after and entirely independent of the operation. A prevention of this disease, while very difficult, can best be accomplished, if the patient is up and out of bed, at the earliest possible moment, at most in a few days, in a wheel chair. Have him walk about in a week or ten days in a warm room, with plenty of fresh air but no draught to avoid chilling. A careful mouth hygiene is most important.

If there is a considerable impairment of the kidneys, due to backpressure or infection ascending before or after operation, it most always results in uremia and very often in death. Practically the only prevention of this complication is a thorough preparation of the patient before operation through prolonged catheter drainage and by giving him large amounts of water, increasing the phthalein output and by bringing down blood urea. It is imperative that the water cure be continued after the operation, either by mouth, proctoclysis, subcutaneously or intravenously, more particularly if fever or localized symptoms should indicate an oncoming pyelitis. If the water cure is interfered with by hiccough or nausea, these must be counteracted with all possible means.

Of all cardiovascular complications pulmonary embolism is by far the most prevalent. While it may be caused by some cardiac disease, yet it appears to be brought on most often from some cause in the operative field. Any cardiovascular disturbance must receive the greatest possible attention. When we consider that these patients are well advanced in years and most of them have a more or less advanced arteriosclerosis, we will have to think of a possible cerebral hemorrhage. Therefore, it behooves the operator to bring the high bloodpressure down as far as possible before operation is undertaken. Myocarditis is a complication which is very difficult to combat and it forces the taking of some chances. In such cases it seems best to use ether anesthesia, since it is well known that ether is a heart stimulant. Of course, great care will have to be exercised, particularly to avoid ether pneumonia.

Aside from shock, it seems infection is to be most dreaded and therefore everything possible must be done to prevent it, or if present to combat it, before operation is undertaken. While a urethral or suprapubic drainage will almost invariably have infection as a sequence, yet we must take every possible care to prevent it. The bacillus coli communis is usually the offending bacterium, but fortunately as a rule, it is not virulent. As in a strangulated hernia, it may become very virulent within a short space of time and may be the causative factor in a cystitis, epididymitis, prostatitis or ascending infection of the kidneys. Any of these complicating infections must be promptly combated; if epididymitis by incision and drainage, if cystitis by irrigation with some of the newer mild antiseptics, like mercurophen 1:20,000, or inwardly hexamethylentetramine in large doses or both. Internal hydrotherapy, thoroughly washing out the kidneys, will most often overcome an ascending infection. Of late excellent results have been obtained in cases of infection by the intravenous use of some chemicals and this possibly will give us an additional weapon in this complication and must always be borne in mind. For this purpose mercurochrome, five milligrams per kilo bodyweight in a one per cent solution, seems to be the accepted strength.

A regular evacuation of the bowels must be insisted upon and measures to procure this must be taken. Nausea and vomiting which by reason of pressure in the operative field, where they are apt to do great damage, are a very annoying occurrence, must be treated by every possible means in the most vigorous fashion. Liquid petrolatum with agar-agar and extract of colocynth will usually prevent trouble along this line. If there is much flatus, a small high colonic tube may be placed so as to reach beyond the sigmoidorectal sphincter and hot turpentine stupes may be placed upon the abdomen. Enemata must *not* be used.

In caring for the wound the drainage tubes and gauze can be removed after twenty-four to thirty-six hours. In the perineal operation urine is permitted to escape through the lateral perineal wound which is irrigated with a mild antiseptic solution after each change of the dressing and after each bowel movement. A week after the operation, for the purpose of making the membranous urethra patent and encourage the wound to close, fluid is forced through the penile urethra. If two weeks after the operation normal voiding of the urine has not been reestablished, it will become necessary to pass sounds, but only through the membranous urethra and not into the bladder. This will prevent any damage being done to the verumontanum and therefore cannot produce epididymitis.

After the removal of the drainage tube the fistula will as a rule close within twenty-five days or even sooner. It seems that a persistent fistula is more common after a suprapubic than after a perineal operation. Should a fistula persist, it will be found that the use of a sharp curette will be of great assistance in attempting to close it.

It must be remembered that by reason of the condition prevailing before operation, as a rule the bladder had become contracted and that for this reason micturition may be more frequent than normal, that the loss of tonicity of the internal or external sphincter may be responsible for a leakage of urine upon coughing or sneezing. But if the patient is instructed to retain his urine as long as possible and keep exercising the cutoff muscles during the act of micturition, this loss of tonicity will lessen rapidly and micturition will become normal in a very short while. Permanent incontinence of urine occurs very seldom.

In summarizing the advantages of either the perineal or the suprapubic operation I think it best to enumerate the various points under the respective headings:

SUPRAPUBIC OPERATION

1. The approach is practically bloodless.
2. Enucleation may be done by the aid of sight or touch alone.
3. Stone or other diseases of the bladder are most easily dealt with.
4. If there is a large hypertrophy, particularly of the median lobe, it is easier of access.
5. The prostate is more accessible and by digital pressure in the rectum can be brought still closer, without the use of instruments.

PERINEAL OPERATION

1. Abdominal distention from obstipation or intestinal obstruction or undue gas formation is not so common.
2. The subtrigonal lobe can be brought into view and be separated from the sphincter.
3. By making an inverted V incision into the urethra the entire adenomatous hypertrophy, including the anterior commissure and every vestige of hypertrophied tissue, can be removed.
4. The drainage, being downward, is much more effective and the caretaking of the wound is very simple.
5. Micturition is more perfect.
6. The tearing or cutting into the peritoneum in the suprapubic operation has a mortality of its own.
7. Sterility is caused less often by the perineal operation, a matter of great importance, particularly in the younger class of patients by reason of its psychic effect.
8. There is an easy access to all bleeding points and hemorrhage can be more thoroughly controlled.

BRAIN ABSCESS OF OTITIC ORIGIN*

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From a limited experience and a series of possibly half a dozen cases of brain abscess of otitic origin, I have selected the following two for illustration.

Case 1. A young man, twenty-seven years old came to me complaining of severe pain for the preceding two weeks in the left ear. Examination showed a small perforation of the drum and a small amount of discharge but without acute mastoid symptoms. During the next two or three days his pulse ran between 56 and 70, temperature 101.3°. Pain continued and there was unquestionably beginning mental hebetude. Without too much detail it may be said that after consultation the mastoid cells were exenterated and the dura exposed in the region of the tegmen, where a subdural abscess was found. This was freely drained. No suspicious spot being discovered on the dura, it was decided to watch the effects of the decompression. The patient, however, rapidly became worse. Temperature dropped to subnormal, pulse slow and nourishment was refused. The patient then became comatose and death ensued within a few hours.

Autopsy revealed an exceedingly long, narrow and tortuous sinus from the dura in the mastoid region, connecting with an incapsulated pus cavity the size of a small peach in the temporal region.

Case 2. M. N., school girl, age twelve years. Family and personal history inconsequential, except that at the age of three a left mastoidectomy had been performed, leaving a shallow depression and a wide keloid scar. She had continued to have a running ear on this side for the past nine years.

On April 20, 1928, she was brought to me complaining of increased aural discharge and pain in the left ear. Examination revealed nothing except the region of the keloid to be edematous and slightly red. A radiogram of the mastoid showed that the operation had been confined to the superficial cells near the cortex. Most cells remained intact, and in the region of the meatus were definitely cloudy. The next day the attendant reported that the patient was somnolent and was aroused with difficulty from sleep. That same evening the left mastoid was opened and all cells exenterated. The meninges for an area of one square centimeter above the mastoid process were exposed and as the dura seemed of normal color and texture it was not disturbed. Two days later, temperature 104°, pulse 140, white blood cells 24,700. A thorough physical examination by Dr. John Montague revealed nothing further than the ear condition to account for the child's symptoms.

The patient now became restless, picking at the bed clothes and moaning in her sleep in apparent pain. Three days after the mastoid operation her temperature was 104.2°, pulse 140. There was inability to coordinate speech or thought and spastic contractions of the right hand were noticed. There was no choked disc. That evening the patient experienced nausea and difficulty in swallowing.

At 10 p.m., April 25, on the diagnosis of probable cerebral abscess, a second operation was performed under light ethylene anesthesia. Cerebral decompression was made one and one-fourth inches in diameter in the temporal region immediately above the ear. There was no bulging of the dura and in gross appearance it was still normal. On incision, however, pus exuded under pressure. A probe slipped readily into a sinus that ran forwards and inwards at least three inches in the temporal region. A grooved director was slipped along the probe. A fenestrated rubber tube of small diameter was then placed along the track of the director. The dural wound was stitched and the patient returned to bed.

The next day the outlook was bad. The patient was restless, had a certain amount of shock, and refused food. Convulsions of the right arm and later of the right leg now occurred at from fifteen minutes to one or two hour intervals and lasting from one to two minutes. There was an internal strabismus of the right eye. Convulsions continued for five days following. There was complete aphasia. The patient was irrational and continued to resist any effort to feed her. Only the most painstaking and devoted efforts on the part of her nurses brought about the final happy result.

The wound discharged freely, at times so much fluid appearing that it was evident that a ventricle had been entered. In another five days, however, the convulsions ceased almost as suddenly as they began. The patient's entire appearance changed, consciousness returned and prospects brightened. The original small drainage tube was being replaced daily with a shorter one of less diameter till by the end of the third week all tubing was withdrawn.

The dural wound reopened and there was a large cerebral hernia due to intracranial pressure. A portion of this sloughed and was excised. The rest was forced back by pressure dressings and a plastic operation, performed by Dr. W. H. Bueermann at Doernbecher Memorial Hospital, completely closed the area and gave it protection.

The hemiplegia has disappeared and the child uses her right arm and leg freely. The right internal strabismus is still somewhat in evidence. This strabismus is probably accounted for by a small area of meningitis in the base of the brain on the right side near the sixth nerve center. The aphasia is still manifest but the speech is gradually returning with effort. Mentality seems unimpaired.

DISCUSSION

Brain abscess and its attendant conditions will probably continue to find a place on our medical programs for generations to come. The complexity of structure of the brain and nervous system account for the diffculties of diagnosis and treatment. Limitation of time prevents discussion in a way that can be satisfactory either to hearer or to writer.

My excuse for choosing this subject is two fold: First, to emphasize by repetition the tremendous importance of a running ear. Second, in a field so complex and where procedures are so various we must not neglect to note a single step forward in diagnosis, therapy or surgical procedure. In the Le Maitre method of dealing with cerebral abscesses I believe a distinct advance has been made.

Too much emphasis cannot be placed upon the strategic position of the middle ear and the mastoid process as a source of infection. Its commanding location is evident upon even a cursory survey of the anatomy. Anteriorly lie the carotid sheath and the eustachian tube. Posteriorly, are situated the facial nerve, the lateral sinus and cerebellum.

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* From the Department of Oto-Laryngology, University of Oregon Medical School.

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Inferiorly, the jugular bulb, superiorly the meninges. Particularly in children, where the eustachian tube is short and straight, the possibility of infection spreading readily from the middle ear to the throat is manifest. Coughing, blowing the nose, sneezing, swimming, diving, swallowing, hiccoughing, etc., especially in the presence of a purulent infection of the nose or of an accessory sinus, may result in an abscess of the middle ear. The bony roof above the mastoid attic and antrum is thin at best, often imperfect from dehiscences so that pus in the middle ear directly bathes the dura. Even where the bony tegmen is intact the emissary veins furnish a route for infection. The widely quoted statement of Oppenheim is then the cause of no surprise when he says, "Chronic purulent otitis media is the most important cause of brain abscess, as it gives rise to a half or at least a third of all cases."

In Osler and McCrea's textbook is the following statement: "One-third to one-half of all cases of brain abscess are said to follow purulent otitis media. Mastoiditis, temporal bone disease, and the so-called cholesteatoma of the otologist, and cases of otitis media which do not secure complete drainage either naturally or surgically are especially dangerous. Less frequently brain abscess follows immediately upon an acute otitis media."

Heiman's often quoted series of eight hundred nineteen cases of brain abscess of otitic origin, of which six hundred forty-five were adapted to study, show four hundred fifty-six in the cerebrum, one hundred eighty-eight in the cerebellum and one in the pons. They were most usual in the third decade of life, two to three times more frequent in males, and evenly divided between the two hemispheres.

The Leeds Infirmary series of eight hundred cases of operations upon the mastoid showed that 18.1 per cent of the cases developed intracranial complications. Half of them were brain abscesses.

We may describe the periods in the history of a brain abscess as: (1) Initial, (2) latent, (3) manifest, (4) terminal. The initial stage is of course coincident with some middle ear suppuration. From six to seven weeks is the necessary period for the formation of a brain abscess. One celebrated case of Newmann's, however, developed after two weeks. The latent stage is often prolonged, indeed life may terminate from some intervening condition and the patient carry an inactive brain abscess to the grave. A second latent and a second manifest stage are possible.

The degree of danger of a brain abscess is dependent on the presence or absence of a capsule. This membrane forms slowly and is usual in the chronic cases but may occur in acute cases. If none is present there is a greater likelihood of finding virulent organisms. If the abscess is superficial and encapsulated the problem is comparatively simple. Noncapsulated cases usually die from encephalitis: capsulated cases die from meningitis. It is often difficult to tell on palpation by the probe whether or not we are dealing with an encapsulated abscess. If on aspiration we withdraw clear pus, it is probable a capsule is present. If particles of brain substance come away with the pus, the inference is that no capsule is present.

Time will not permit our going deeply into questions of diagnosis and relative importance of various symptoms. Great patience and care in interpretation of symptoms is of course imperative. A sudden increase in the amount and in the foulness of odor of the aural discharge, coupled with dizziness and a slowing-up of cerebration are suggestive of brain abscess. Headache, lack of appetite and depression are also often noted. Crossed convulsions, hemiplegia, hemesthesias, facial paralysis, motor and sensory aphasias are not caused by the extension of the abscess to these centers but are due to the remote action of increased intracranial pressure. There may also be present sixth nerve palsy, diplopia, ptosis and irregularity of the pupils. Nystagmus is sometimes present, but more frequently in cerebellar than in cerebral abscess.

Temperature after a radical operation on a mastoid always arouses a suspicion that a brain abscess in its latent stage existed at the time of the operation without our knowledge. Meningitis also developing after a radical mastoid is an indication that a latent stage existed.

Cerebral vomiting occurs in all intracranial cases and is not distinctive of abscess. Erysipelas may also be differentiated by the pulse rate; rapid in erysipelas, slow (50 to 60) in brain abscess.

Annestic aphasia often occurs, i.e., inability to give the name of an object but giving its use, e.g., "a book—to read." Another common symptom is what the Germans call "perseveration," a hanging-on to a word, i.e., continuing to use the same expression for a succession of objects. Where a number of languages are spoken the aphasia may appear in using one language and not in another. Sometimes delayed aphasias arise immediately following the operation of a brain abscess, the delayed appearance being due to reaction following the decompression.

Choked disc is not so dependable or so invariable a symptom as was formerly thought. We now no longer wait for its appearance. It occurs in various intracranial complications, in the following order of frequency: (1) temporal lobe abscess, (2) cerebellar abscess, (3) sinus thrombosis.

Yet, unfortunately, we must note Schwartze's dictum, "All symptoms of an abscess may be present and no abscess. All symptoms may be absent and yet an abscess be present." Headache, vomiting and mental hebetude are not sufficient symptoms on which to base diagnosis, as these may arise in the course of an acute otitis and disappear when paracentesis is performed. Neither are dizziness and high fever of any help in the diagnosis. Increased foul discharge coupled with aphasia, hemiopia, and a slow pulse compel an immediate operation. Exploratory cranitomy in itself is not a dangerous procedure, and in the hands of a competent operator should be resorted to in doubtful cases.

Mortality either with or without operation is unhappily high, but in surgery lies our only hope. We must not refuse the chance offered a patient by operation on account of high spinal cell count, rigid neck or unconsciousness. Rigidity of the neck and flexor spasms (Kernig's sign) may only indicate a limited area of meningeal irritation and if the spinal cell count is only slightly increased and consists of lymphocytes, the patient should not be denied operation. Even if meningitis is already in evidence, if the cells are polymorphonuclear and high in number and cultures are positive, we must not forget that in operation rests the only chance for recovery. Every brain abscess operation is naturally exploratory and the patient is entitled to an exploration which can be performed with comparative safety.

To quote Le Maitre, one of the highest French authorities, "The gravity of brain surgery owes its existence to the meninges or rather to the subarachnoid spaces. Suppressing this danger, the problem is even relatively simple since the first stage of brain operation, viz., trepanation, is a procedure that is attended with little risk, as we find often from uncovering the dura in the course of a simple mastoid. The third stage, operation on the encephalon, is also relatively benign. The brain is an organ of great tolerance as is proved by the harmlessness of exploratory puncture, and confirmed by the history of war wounds on the cerebrum and cerebellum. Hence the desirability of walling off the subarachnoid spaces, through which meingeal infection necessarily arises."

Gross inspection of the dura is often deceptive, as many cases are reported in which the dura appeared normal to the eye and yet a brain abscess developed. We must beware pronouncing any exposed dural area normal. And although exposure of the dura in the course of a simple mastoid operation is common and usually harmless, all such cases should be watched with the greatest care until well past the danger point.

Ruttin states that "a small tit-like elevation on the dural surface with a thrombosed vein at its center" is an indication of an infected dura, while abundant granulations indicate a brain abscess behind the dura.

The usual technic of operation is known to you. The anesthesia should be either local, or, if general, should be very light. The general surgeon is accustomed to choose for his approach the clear field of the temporal region above the mastoid wound. The logical point of attack, however, is at the port of entrance, i.e., the tegmen tympani, because it is the lowest point available and thus more conducive to drainage. Ballance[6], in suspected cases of brain abscess, makes a free incision of the dura, separates the flaps far enough for an exploratory examination and then waits twenty-four to forty-eight hours which sometimes relieves the urgent pressure symptoms. This permits the pus to take the line of easiest resistance toward the cut dura and also produces a certain amount of sealing off of the dura, often preventing meningitis and fatal outcome. This is a modified decompression adapted only to non-urgent cases and if such a procedure is followed we must sit by, as Ruttin says, "with knife in hand." Where is is possible to avoid the usual dangers incident to incising the dura, it is our duty to do so.

Miodowski of Breslau hit upon the ingenious plan of making daily application of an iodine wick to set up a low grade localized inflammation of the dura and cause adhesions so that incising the dura later was accompanied by less danger. The method now receiving almost universal commendation wherever it has been tried, however, and which I would call to your attention, is that of Professor Le Maitre of Paris, based upon his theory explained above and generally accepted, that the mortality in brain abscess cases is due to meningeal infection and that this infection is delivered not through the dura nor through the brain paths but through the subdural spaces. These spaces he successfully walls off. In his own words he proceeds as follows, "When the meninges are exposed and the pus location has been indicated by means of the needle, instead of cutting the membranes by a sharp instrument, I introduce at the site of the needle a grooved director, allowing the pus to partially evacuate by this means. In abscess of the cerebrum this is important, but it is even more important in cerebellar abscess, because it is known that the pus under tension is not as well borne by the cerebellum as by the cerebum. Then a small rubber drainage tube is introduced through the small meningeal opening. I have observed that the presence of this tube provokes the formation of fibrous adhesions, which wall off the subarachnoid space. Every day a larger tube is substituted until a diameter of from nine to eleven mm. is reached. By this time a strong, firm ring of fibrous tissue surrounds the tube, which now functions as a drain. In cerebellar abscess at this stage I replace the small soft tube by a vulcanized one, which is specially prepared in my laboratory. The particular features of these tubes are that they are fenestrated and the anterior ends are cut obliquely. This obliquity prevents contact between the tube and anterior portion of the sinus, thus avoiding traumatism and grave hemorrhage. In subsequent dressings these tubes are diminished in length but not in caliber, as granulation tissue appears and pushes the tube outward. It is better to await spontaneous expulsion than to withdraw the tube."

This procedure rests upon the fact that the meninges may at any desired point be transformed into a fibrous layer and this induced seclusion of the subarachnoid spaces should always be secured when the surgeon intends going into the brain. Meningitis is prevented by the same process by which general peritonitis is averted in a case of appendicular abscess, differing only in that the walling off here is induced; in the abdomen it is spontaneous. The rationale of this method has been definitely proven. Professor Le Maitre had treated in this way a case of cerebellar abscess which died from a second cerebellar abscess developing after the first abscess was progressing to a cure. Autopsy showed a dense resistant ring around the drain; in the tissues beyond the microscope nothing was revealed.

Three things are accomplished by the Le Maitre procedure:

1. Subarachnoid spaces are successfully walled off and the danger of infection prevented.

2. Hernia of the brain cannot occur because the brain is restrained by a reinforced barrier.

3. Gradual increase of the diameter of the drainage tube, while decreasing its length, prevents another great danger, viz., that of leaving within the brain undrained pus pockets. It is important that drainage should not be discontinued too early and it is advisable to continue it from four to five weeks.

In conclusion, let me repeat that even in an acute or an apparently acute infection of the middle ear, the possibility of a brain abscess must be kept in mind. A running ear is always a threat against the subsequent health of the individual. A health examination is not complete without notation of aural discharge if present. No parent should be allowed to rest secure in the belief that a running ear is harmless. The appearance of any of the symptoms noted above in the course of a suppurating otitis, particularly if accompanied by mental disturbance, should be carefully investigated from the standpoint of possible brain abscess. Finally, the operative procedure which involves the least danger of infection through the subdural spaces is the one of choice.

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Irradiation of Ovaries and Hypophysis in Disturbances of Menstruation. The continued study of a group of cases of primary oligomenorrhea and amenorrhea and of menorrhagia and metrorrhagia has further convinced Della G. Drips and Frances A. Ford, Rochester, Minn. (*Journal A. M. A.*, Nov. 3, 1928), of the existence of an essential ovarian hypoactivity in both conditions. The occurrence of spontaneous remissions and the variable results with all forms of treatment add difficulty to the evaluation of a new method. Low dosage irradiation of the ovaries or hypophysis offers an additional therapeutic measure in intractable cases. The low dosage irradiation has given a comparatively high percentage of favorable results in view of the severity of symptoms in the cases in which it has been used, and regulation, when attained, has continued over a relatively long period. In experimental studies which are still incomplete, an attempt was made to gage the amounts of roentgen rays for application to the ovaries of white rats which might be comparable to low dosage irradiation in the human being.

THE PROBLEM OF ANKYLOSED OR PARTIALLY ANKYLOSED JOINTS *

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The free movement of any joint depends upon two mechanical factors, both absolutely essential, either one worthless without the other. The first factor is intraarticular, the second, extraarticular.

Intraarticularly we must have smooth surfaces, free from an excess of new bone formation and from tight adhesions. Adhesions may exist and still permit of free motion, provided that these are long adhesions so placed that too great a strain may not be placed on them incidental to motion. Bony growth from fractures or from arthritis may not seriously interfere with motion, provided that the growths are not too extensive and are so placed that locking, or partial locking, does not occur.

Extraarticularly we have the capsule and its attached ligaments and the muscular structures that move the joint. For free motion to occur, the capsule must not be seriously affected and the muscular structures that move the joint must not only be nonaffected but be reasonably free from adhesions.

The two mechanical factors, namely, those that are intraarticular and those that are extraarticular, must be clearly understood and clearly differentiated in any given case for successful treatment to be instituted. Failure to differentiate between the two is apt to lead to disaster.

Changes within the joint are the result of any one of the various forms of arthritis and of trauma. Trauma may result merely in synovial changes, i.e., fibrosis, or it may be carried further and produce a new fracture, on top of which we have a fibrosis. Probably there is no such thing as an intraarticular fracture occurring without some fibrosis, the degree of fibrosis being in proportion to the degree of trauma.

The prevention of ankylosis, or partial ankylosis, is always the end to be sought. Nearly two hundred years ago, the principles of preservation of motions in joints threatened with partial ankylosis were clearly set forth by John Hunter and since that time the principles have never been more clearly stated.

"Hunter recognized the value of movement after sprains and other injuries to joints, and showed that inflammation of the joint, traumatic or otherwise, was accompanied by the outpouring of coagulable lymph and by the formation of adhesions."

To quote from John Hunter, "Nothing can promote contraction of a joint so much as motion before disease is removed. When all inflammation is gone and healing has begun, a little motion, frequently repeated, is necessary to prevent healing taking place with the parts fixed in one position."

Hunter recognized that joint inflammation must always be followed by adhesions, but the parts would stretch and motion again become free by gradual motion and function.

The preservation of motion, following arthritis, is one of the most difficult problems we have to face. All too frequently the problem cannot be solved, and partial or complete ankylosis is the inevitable result. Tuberculous arthritis is not to be considered in this paper, for the reason that the end result to be desired is always bony ankylosis in a good position. Suppurative arthritis or gonorrheal arthritis is likely to produce limited, painful motion. To prevent this, some type of surgical treatment is urgently indicated. Certainly this is true in the suppurative arthritis, and I am inclined to think the same thing is true in gonorrheal arthritis.

The mild suppurative arthritis, due to staphylococcus albus, very frequently may be speedily controlled by aspiration and absolute rest. Following this, when the disease is a thing of the past, gradual motion—never under an anesthetic—will restore the joint to normal.

In these severe types of suppurative arthritis, it is my opinion that the treatment of Cotton should be given a trial, especially in the treatment of knee joint infections. This consists in making a very small opening through the capsule, a quarter to a half inch, followed by irrigation with a large quantity—a gallon or more—of mild antiseptic, the flushing being continued until the fluid returns quite clear. The wound is then tightly closed and the part put to rest. Several times I have carried out this procedure in suppurative knees with perfect results in every instance.

The innumerable forms of nonsuppurative arthritis have a tendency to lead to limited motion, usually painful, or to no motion, usually not painful. Naturally the first step in the preservation of useful motion is to eliminate the cause. I need not tell this group that this is a search in the dark, or at least in the late twilight. Possibly when we become more enlightened, we may look upon abscessed teeth or infected tonsils as a result rather than a cause.

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It may be that the colon is the source of many of the arthritides, or perhaps the food has something to do with it. What part does constipation play? I do not say that infected teeth or infected tonsils are not a frequent cause. I am merely wondering if our search has gone far enough.

Regardless of cause, limited joint motion or ankylosis may result. So long as the disease is active and progressive, the treatment is supportive and symptomatic. Many measures are used, most of which are of doubtful value. Some of them apparently have real merit, while many are obviously so worthless as to deserve no consideration by this society. I shall not go into this phase of the treatment.

When the disease has spent itself, leaving a joint that is partially ankylosed and usually painful, we may take stock of the situation and map out a campaign. If we are fortunate enough to have left a joint with practically normal joint space, we may accomplish a complete or nearly complete cure by the usual method of massage, active and passive motion, gradual stretching in a brace or divided cast, never carrying the motion to the point of producing much pain, and never under an anesthetic.

I know of no mysterious light or electrical current that will dissolve adhesions, or that has any appreciable effect upon cases of this sort. The adhesions must stretch and stretch gradually, or they must be broken without enough force to produce hemorrhage and, therefore, more adhesions. To produce motion forcibly, under an anesthetic, is without doubt the worst thing that could be done with such a joint. Where the joint space is considerably narrowed and the formation of exostoses is fairly numerous, a complete synovectomy, especially in the knee, is well worth considering. It should be complete, every vestige of synovia being removed. This should be followed by the usual active and passive motion, stopping short of much pain and never being carried out under an anesthetic.

You will obtain some good results. You will have some failures. The worst that can happen is a return to the former condition, in which case you have left either an arthroplasty or an arthrodesis. The joint that becomes quiescent, with a marked narrowing of the joint space and is still painful, should have either a successful arthroplasty or an arthrodesis in a good position. It may not be painful, in which case it certainly should be left alone, provided the position is useful. The ankylosed joint, especially in a bad position, should either be ankylosed in a more useful position, or have an arthroplasty.

Whether or not to do an arthroplasty must depend upon the condition of the other joints. If both hips are ankylosed, some type of arthroplasty of one is almost imperative. If both knees are ankylosed, it is wise to attempt an arthroplasty of at least one. In ankylosis of the elbows, one or both, an arthroplasty offers every chance of success. Here the chances are better than in any other joint in the body. Where a single hip or single knee is ankylosed, or partially ankylosed, I would have considerable hesitancy in advising an arthroplasty. I have seen many so-called successful arthroplasties of the hip and of the knee. A few were quite wonderful, but in many of the instances I am just a little bit inclined to think that I would have preferred a stiff, painless joint in a good position.

In the joint with a limited motion, following a fracture into the joint, we have the same indications for restoration of motion that we have in the arthritic cases and for the same reason. Here we are dealing with intraarticular adhesions plus some contraction of the capsule, plus a moderate amount of muscle adhesions. The adhesions in the muscles are not serious and call for no treatment other than that given the intraarticular adhesions. Brisement force has no place in the treatment of a joint partially stiff from intraarticular fracture. To apply force sufficient to justify an anesthetic in order to break up adhesions can only mean injury to the capsule, hemorrhage from the capsule and from the adhesions, increased pain, and a greater number of adhesions, denser than the ones that you have just broken up. I know of no better way to defeat your purpose than the use of the very procedure I have just condemned. It is quite possible that you may never succeed in completely restoring the motion in the joint. But passive and active motion, plus a force that stops short of severe pain, will give you far better results than you may ever hope to attain by applying force under an anesthetic.

Limited motion in joints, following a fracture above the joint, is a condition that is frequently misunderstood. In no other way can we account for the treatment that is frequently given such cases.

Why is the joint motion limited? Certainly not by any serious changes in the joint. The changes in the joint are so trivial that they may be disregarded. The real difficulty lies in the adherent muscles above the joint. Especially is this true following a fracture of the femur that has had an open operation.

There is a fallacy that runs through medical practice, but not through medical literature, that motion in the involved joint may be restored by forcibly bending the same, under full anesthesia. What happens when this procedure is carried out in the case of a knee, for example? The most favorable thing is that the muscles may stretch sufficiently so that flexion of the knee may be produced. The likely thing is that the muscles and fascia, and possibly the capsule, may be torn in various places, which completely defeats the purpose of the procedure. Tearing of the muscles necessarily means more fibrosis, more adhesions, and a knee that is more limited in its motion than it was before. The unfortunate result is all too frequently a refracturing of the femur or a fracturing of the patella. I personally know of ten cases of fracture of the femur, from this procedure, three cases of fractures of the patella, and one case of sudden death from pulmonary embolism.

The procedure is unsound physiologically and mechanically and should be relegated to the scrap heap. Given an elbow markedly contracted from extensive burns at the bend of the elbow, would any surgeon attempt to restore that elbow to normal by forcibly tearing the scar to pieces under an anesthetic? And yet such a procedure seems to me to be no less absurd than that of applying great force under an anesthetic, in an attempt to restore the partially ankylosed joint. Gradual motion, active and passive, force that stops short of severe pain, these will give you a good result, whenever it is possible for a good result to be obtained.

SUMMARY

The chief object of this paper is to bring before you for condemnation, a surgical procedure that is quite common and which is unsound in every way, in my opinion.

Foreign Body in Lacrimal Sac for Seventeen Years. Frank H. Rodin, San Francisco (*Journal A. M. A.*, Nov. 17, 1928), reports the case of a woman, aged 37, seen recently, who had had a right acute dacrocystitis in 1904, at which time the lacrimal sac had been incised. Seven years later she had a "white growth in her throat." This was removed, and the attending physician, having decided that the growth was caused by her old eye condition, tried to put a metal drain in the lacrimal sac but was unsuccessful. Then he placed a solid silver stilet, apparently first making an opening into the nasal cavity through the lower punctum and the region of the lacrimal sac. The stilet had been in the nose ever since.

SHOES *

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As shoes are the one article of clothing that interfere with the flexibility of the part covered, an outline of the ideas of the shoe manufacturers as expressed in their styles will aid in determining a proper fit for any particular case under consideration. This paper does not deal with the corrective appliances or changes that might be made in a shoe, but is intended to give an idea of the whys and wherefores of shoes and their relation to the foot. A properly fitted shoe will often correct trouble caused by a misfit, except where bony changes have taken place, but even in these cases the symptoms may be relieved.

To arrive at what is a proper shoe the various elements entering into the question must first be considered. By this I mean the size and the style, i.e., low or high; the width, kind of arch and height of heel. These in turn are considered in relation to the foot to be fitted. I do not believe there is any particular make of shoe that will satisfactorily fit all cases, but the principal idea in all shoes is to allow the foot to function without much restriction.

Too often we find people trusting to the judgment of the shoe clerk for the correction of foot trouble. As every shoe manufacturer makes so-called corrective shoes, based upon some one idea, the shoe salesman always advises the brand he sells. If some one idea, incorporated into a shoe, could correct the ills of the feet, why not make all shoes after that pattern and eradicate all future discomfort of the feet.

The first question that naturally comes up is what is a normal foot, but this I leave unanswered. However, we may consider for all purposes as far as shoes are concerned that a normal foot is one that has flexibility without pain. I realize this does not apply to all cases, as extreme acquired flat feet may be flexible and painless.

How often we are told by shoe salesmen that the size of the shoe, meaning the length, can vary with the width. That is, the longer the shoe the narrower the last and the fit will be the same. We see shoe clerks measure a foot from heel to toe tip and every store has its own system of telling the size from the reading obtained. Some deduct a certain figure and others another, but they all deduct some, as the reading on the scale is not the true shoe size required, and different manufacturers use different systems of sizes for shoes. However, the sizes of the various makes run very close. A size, which is one-third of an inch, varies on different scales, depending on where one starts reading.

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As most often trouble arises in the arch, it is that part of the shoe that requires the best fit. As arches vary in different people, so can the toe vary. A person may have a long arch with a short toe, while another will have a short arch with a long toe, although the feet of both will be the same length over all. Shoes are sized for length in the factory by the distance from the back of the heel to the ball of the big toe. This latter region of the shoe is called the break of the sole and is generally shown on the inner edge of the sole by an angle where it narrows in for the arch. With the foot in the shoe the bunion joint should be directly over the break, and regardless of width of the last, the relationship of the break to the joint should always remain the same. The reason for fitting in this manner can be understood when the nature of the arch is explained. The average foot lengthens one shoe size when walking. This leaves a range of about one size from the exact fit.

The toe part, called the vamp, varies in different styles, particularly in women's footwear, and is often shortened to give the appearance of a short foot. In pumps this is necessary in order to crowd the toes to keep the shoe on. Spike heeled pumps have an arch with an acute drop which makes the wearer walk on the head of the metatarsals and many times causes inflammatory reactions at this point. This acute drop in the arch is necessary to keep the shoe on, as it prevents the foot from sliding in the pump and thus allowing the latter to drop off. It is another example of the abuse given the body by women for the sake of style.

There are two kinds of arches in use, the flexible and the rigid. The argument for the flexible is that it leaves the foot more freedom to function, and the fact is cited that the savage needs no arch support. The savage, it is claimed, has a normal foot. There are two conditions to be considered before comparing savage with civilized feet. First, the surface upon which the savage walks is uneven and yielding so that the ground partially fits the arch and supports it, while civilized man walks on concrete or wood, which never shapes itself to the shape of the foot. The second consideration is that, since we are raised from infancy with more or less rigid shoes, when adult life is reached, the arch has lost part of its ability to withstand the constant hammering of the weight of the body. This for an average person of one hundred fifty pounds, walking five miles a day, is approximately eight hundred fifteen tons.

Shoes with flexible arches are always made with the inner edge of the sole curved in. This is to force walking on the outer side of the foot and thereby hold the arch up. While there are some people who can wear flexible arched shoes, the great majority need some support reaching from the heel forward towards the sole. The length of this should be in relationship to the length of the foot, and for that reason the position of the foot in the shoe has a definite place. This explains why one size and one size only will fit properly.

There is one shoe on the market that has a strap of webbing which is supposed to hold the arch up. In other words, the arch holds itself up by its own boot straps. Several other makers depend on pulling tight the leather of the upper where it swings under the arch. This gives a comfortable feeling when the shoe is new but if the leather stretches, as it usually does, the support is gone.

In the rigid arch shoe there may be variations from a strictly rigid arch to a slightly flexible one. The arch is made rigid by a strip of metal or sometimes wood, running forward from the heel. As can be seen, the wooden strips would make a semiflexible shoe, while the very rigid metal strips would be at the other end of the scale and be very nonflexible. There are many variations in the metal strips, each maker claiming some particular virtue for his system of shaping and cutting it. Some manufacturers of the stiff arched shoes raise the arch above the ordinary level, thereby putting an arch support in the shoe. One maker puts a two-piece metal arch strip which works as a hinge and this hinge should, of course, be under the astraglo-navicular joint. If the shoe does not fit perfectly, it will be off center and will cause trouble. Another maker claims that his metal strip is shaped so that it cannot bend down but has just the proper spring up. If this were true, one would be out of his shoes in a few steps.

Why do cheap shoes fail to keep their shape? The cheaper shoes are made of chrome tanned leather and this leather will stretch when damp. When the upper is stretched over the last by machine, the latter pulls at the same tension on all the parts. The material used in the counter also has a great deal to do with the retention of the shape. The better grade of shoes are made of oak tanned leather which does not stretch.

The width of the shoe should be one that allows for the comfort of the foot. There is an idea held by many that the shoe keeps the foot from spreading. However, in a normal state there is no spread of the bones, either in the naked foot or in the foot encased in a properly fitted shoe, although the soft parts may spread. The heel should fit snugly, as a heel that is too wide will allow a tilting of the os calcis and this in turn will produce flat feet. That is why some people with flat feet do not obtain comfort from a rigid arch shoe. As there can be a difference in the relative length of the arch and vamp, so also can there be a difference in the relative width of the ball and heel. Many manufacturers of better grade shoes take this into consideration and make models with changes in the width of the heel in comparison to the width of the transverse arch.

The question of low or high shoes is often asked. In patients who have a tendency to turn their ankles a low shoe often helps to develop strength in the ligaments of the ankle, while in others the weakness of the ankle is such that it must be supported with a high shoe. The question of high or low shoes is the only one in which the style of the day interferes with therapeutic modifications. Other modifications can be made without making the shoe unstylish. Toes should always have free play and shoes should be long enough so that the toe will not touch at the tip. Shoes which are too short will cause a deformity of the toe nail in children and the deformity will increase with age, regardless of ordinary care. Many nails have been removed in adults because of short shoes worn in childhood. A short shoe will cause an inward tilting of the os calcis and this in turn a pes cavis.

The height of the heel must be considered. The moderately high heel is the best but changes from low to high or high to low suddenly is always productive of pain and discomfort. If there is any reason for the change, it should be accomplished gradually. High heels, that is, French or spike heels as worn on women's shoes, always interfere with the correction of any foot trouble, as they throw the weight of the body on the forward part of the foot. With a foot kept in such an abnormal position it is impossible to make it normal in other respects. These heels also tilt the pelvis forward and this abnormal position produces a lordosis and strain of the lumbar ligaments.

The so-called orthopedic heel is one that is brought forward on the inner side to a point under the astragaloscaphoid articulation. This holds the arch of the shoe up and in this way performs the function of the steel strap which is placed in the rigid arches but it does not allow the flexibility of the steel arch. Here is another place where the length is important, as the edge of the heel will not be under the astragaloscaphoid joint, if the shoe is not of proper length.

The shape of the last or whether the shoe should turn in or out is often a question. One manufacturer claims that all feet turn in and builds his shoes accordingly; another makes turned in, straight and turned out ones and fits according to the foot, but most manufacturers say nothing and make their shoes moderately straight and these fit about 95 per cent of the people.

A foot that is flexible can be comfortable in a shoe moderately turned in or out but it is the foot with some rigidity or spasticity that will soon be uncomfortable in anything but a perfectly fitted shoe.

Shoes will not correct defects of the feet but by allowing exercise of the weakened muscles and at the same time giving support, they can help in a cure. Too often a patient thinks that a different slipper or shoe should cure all his foot trouble. This is an impossibility, but if the trouble is due to a poorly fitted shoe the proper shoe will correct it.

FIBROSIS OF VESICAL NECK. Robert H. Herbst, Chicago (*Journal A. M. A.*, Nov. 24, 1928), believes it is not unlikely that some, if not many cases of fibrosis seen in adult life, start as hypertrophy of the muscle tissue at the neck of the bladder, perhaps congenital in nature, dating back to some fault in embryologic evolution. Infection of the prostate gland with extension to the internal sphincter and adjacent bladder wall is believed by some to play a part in the etiology. Although fibrous tissue may be found in the region of the bladder neck in some cases of prostatitis, rarely does it produce the clinical picture or pathologic changes in the upper urinary tract that are found in true fibrosis of the vesical neck. The symptoms may be divided into two groups: those referable to the bladder and those produced by upper urinary tract changes. The bladder is not commonly dilated, but small, and often contracted because of the hypertrophy of the muscular wall. This condition frequently causes an active form of incontinence, instead of the passive overflow type seen in other forms of obstruction. For this reason, the urgency and frequency are more prominent. Complete retention is not often seen, because of the powerful contraction of the hypertrophic bladder wall. Regurgitation to the upper urinary tract is more pronounced than in most other forms of obstruction.

PEPTIC ULCER

THE RATIONALE OF OUR PRESENT TREATMENT[*]

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A frank and critical review of our past efforts, failures and successes in the treatment of any disease is likely to be a mingling of disappointment and inspiration. Most of us remember our accomplishments and summarize them into a large capital stock of self satisfaction. Usually we fail to either itemize or summarize our shortcomings.

Four years ago I attempted an analysis of all of the cases of gastric and duodenal ulcer treated by me in the department of medicine at the State University of Iowa[1]. At the same time the results of the surgery of our associates were investigated, not for critical comparison but that we might see how to improve the situation. It was with considerable satisfaction that we employed what I may best designate as the cooperative management of peptic ulcer. The department of surgery and the department of medicine were of almost one mind concerning the fundamental principles involved. In this cooperative management it became our business to attempt to administer the best that our judgment could afford. Whenever in our opinion surgery had more to offer than medicine, operation was urged and the patient usually transferred to surgery. Whenever the patient came seeking operation for this condition I had the opportunity of seeing him in consultation before the final decree.

At that time we emphasized the fallacy of separating what might be termed "medical" treatment from "surgical" treatment as if there were two domains. After all, it is only incidental that some of us choose to perform certain medical functions to the exclusion of many others. Because of our own restrictions we must not force these limited methods upon the patient; his chief desire is to be made well. How hard it is for us to imagine ourselves in that same predicament.

If there is any merit in what the internist does by dietary, medicinal, constitutional and hygienic treatment in cases of peptic ulcer, this so-called "medical" treatment is just as applicable after the usual operation for this condition as it was before that operation. It was, therefore, with delight and enthusiasm that we answered many requisitions from the department of surgery asking us to direct the prolonged postoperative management when gastroenterostomy was done. I must admit that in my earlier experience, trained under the late Dr. Sippy, I rode the hobby of that exclusive management and somehow believed that most ulcers without perforation and scar tissue obstruction belonged to medicine. From this view I have been happily weened.

Again, in the past few months I have attempted by questionnaire to ascertain the degree of success in the treatment of peptic ulcers where surgery was not used. The very irregular course of this disease must be remembered and I scarcely know when to pronounce a patient cured. I feel sure that some of the patients now free from symptoms for a year or more will later have a return of their trouble. I realize that the value of this treatment is for the present at least considerably inflated.

This review attempted to determine what has happened to four hundred ten patients after two years or more have elapsed since stopping all actual treatment. It is too early to consider any of the more recent cases as even probable cures. (Tables 1 and 2).

TABLE 1

RESULTS OF QUESTIONNAIRE IN PEPTIC ULCER PATIENTS

	Cases
Questionnaires sent to	410
Replies from	294
Death or severe illness from other cause than ulcer in	10
Incorrect diagnosis (approximately)	11
Carcinoma (gastric)	4
Appendicitis	3
Cholecystitis	4
Follow-up data in peptic ulcer patients	273
In 12 (or more) there was an incomplete diagnosis as revealed by operation or definite signs and symptoms warranting additional diagnosis:	
Cholecystitis	7
Appendicitis	5
Relatively complete and correct diagnosis with follow-up in	261

TABLE 2

MEDICALLY TREATED CASES FOLLOWED AFTER TWO YEARS (261 CASES)

	Cases	Per Cent
1. Cured (arrested)	127	48.7
2. Probably cured (arrested)	35	13.4
3. "Much improved" (possibly arrested)	26	9.9
Total	188	72.0
(Gastric 16, duodenal 172)		
4. Probably not cured ("better," but symptoms persist)	11	4.2
5. Definite failures (hemorrhage, persistent or recurrent symptoms and in some operation performed for relief, some reexamined, etc.)	62	23.8
Total	73	28.0
(Gastric 19, duodenal 54)		

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[*] Read before the Fifty-fourth Annual Session of the Oregon State Medical Society, Portland, Ore., September 20-22, 1928.

Accuracy in diagnosis is of course essential in the evaluation of any form of treatment. In those cases where the symptoms due to chronic appendicitis, cholecystitis, colitis or systemic disease masquerade as peptic ulcer we have no right to expect results from misdirected medical or surgical treatment. In many of these instances the real surgeon, who after incision is acquainted with the living abdominal pathology, has the internist at a decided disadvantage. At the same time those symptoms which simulate peptic ulcer but are due to physiologic disturbances—I refer to the so-called functional indigestion—may or may not be relieved by medical management and are often aggravated by unnecessary surgery. When relieved they do not constitute medical "ulcer cures." Also it is not sufficient to arrive at a diagnosis of peptic ulcer, and fail to recognize other important abdominal and systemic diseases which must be considered in the treatment.

There are still too many practitioners who diagnose ulcer and treat the patient without the aid of roentgenography. An accurate radiographic localization and a careful clinical study is imperative in all of these cases except in the surgical emergency of perforation. Though the gastric ulcer is only diagnosed about one-fifth as often as the duodenal lesion, only the x-ray can serve to actually localize and visualize the lesion, and if the lesion is gastric the question of carcinoma must always be considered. Among thirty-nine cases diagnosed as gastric ulcer, and treated medically, four have died from cancer of the stomach. The exact relation of gastric ulcer to cancer is still undetermined. That a very considerable proportion of benign ulcers become the site of gastric cancer there can be no reasonable doubt. That the great majority of gastric cancers remain unrecognized or are incorrectly diagnosed as benign ulcers at a time when surgical removal might mean a cure is even more certain. It is, therefore, with a great deal of doubt concerning the outcome and the recognition of a large responsibility that we now undertake the treatment of a gastric lesion "sight unseen." The same reasoning makes us condemn gastroenterostomy for the gastric ulcer, if it is at all possible to excise the lesion.

There are no available accurate data concerning the incidence of either gastric and duodenal ulcer or gastric cancer. The census bureau[2] indicates that 92.6 per 100,000 of population died from cancer in 1925 and of these 33.8 were due to cancer of the stomach. The estimated mortality for gastric ulcer was 4.3 per 100,000 and for duodenal ulcer 1.7 per 100,000. It seems quite likely that some of the deaths attributed to gastric ulcer may have been due to gastric cancer or to duodenal ulcer. At any event the gastric lesion is much the more dangerous.

Robertson and Hargis[3] at the Mayo Clinic from the study of two thousand autopsies (1920 to 1924) attempted to show a marked increase in the incidence of duodenal ulcer in the past half century. They seem to forget that their material does not represent a cross section of our population. Their study is of considerable importance for it indicates an approximate relation between gastric and duodenal ulcer and gastric cancer and, what has not been emphasized elsewhere, the great frequency of unrecognized and undiagnosed lesions. In the two thousand cases studied there were three hundred seventy-eight (18.9 per cent) gastric or duodenal ulcers. Of the one hundred forty-one gastric ulcers one hundred twelve were active and only forty-two (30 per cent) of the one hundred forty-one gastric ulcers had been diagnosed. Among the two hundred thirty-seven duodenal ulcers, one hundred forty-three ulcers were active and only ninety (38 per cent) of the entire group had been diagnosed. Of especial interest is their finding of fifty-two (2.6 per cent) active ulcers in the colon, forty-two (2.1 per cent) in the ileum and twenty (1 per cent) in the jejunum. One hundred and eleven (5.55 per cent) had cancer of the stomach. It is possible that many of the ulcers which they found did not seriously affect the health of these individuals but at least they represented a potential risk during life.

THE ECONOMIC ASPECT

Occurring chiefly in the third, fourth and fifth decades, the mortality and morbidity of peptic ulcer, plus whatever of gastric cancer is secondary to gastric ulcer, represents a tremendous loss. The economic aspect of peptic ulcer has never been sufficiently emphasized. The surgeons have repeatedly indicated that medical treatment is an expensive procedure, applicable to the well-to-do more than to the working man. If a man could afford it he might resort to a period of rest, diet and inactivity. My own experience has been chiefly with the common people, many of them farmers and working men; only a few of them could be classed as wealthy. I do not recall that I have often urged a change in occupation. Most of my patients have continued with their usual work as soon as a preliminary management had established the advisability of employing such nonsurgical measures. There is no doubt but that surgery offers a more rapid and more certain rehabilitation for the individual who cannot or will not cooperate in medical treatment. The occupation, though a factor in the result, is less important than the spirit of the individual. (Table 3).

In the review of surgical and medical cases four years ago it was learned that the percent of "probable cures" in properly selected cases treated medically was almost exactly the same as in surgically treated cases. Of course the two groups represent different degrees of pathology. To my surprise I found that the surgical mortality in unassorted cases in the University Hospital at Iowa City was 7.6 per cent. A review of the reports of well known surgeons, members of the American Surgical Association[4] (Scudder, Poole and Peck) showed an average mortality of 8.6 per cent and the degree of ultimate success in the cases followed was about 83 per cent. Recently Coffey[5] has reported his own personal experience with a surgical mortality of 2.4 per cent for gastroenterostomy and 4.2 per cent for all operations in four hundred seventy-one cases. Certainly he is to be congratulated on this account as well as upon the total end results (84 per cent without symptoms). I know of only two places in the world, great clinics where there has accumulated an enormous experience in the handling of such cases, that the mortality is reduced to 1.2 per cent or less. In 1923 Moynihan[6] stated that in the ten years just ended he had done five hundred thirty-one operations for duodenal ulcer without a death, and that his mortality in partial gastrectomy was only 1.6 per cent. Surely such a surgeon rightly criticizes both the medical and surgical failures of others. He has emphasized the prolonged postoperative medical management and yet almost 10 per cent of his patients are not satisfied with the end results.

ETIOLOGY

Modern rational therapeutics should attack the causes of a disease. The literature is full of reports of clinical observations and experimental work done in the attempt to discover the causes of chronic peptic ulcer. There are three factors which are especially important in the production of the chronic ulcer. So far as I know the only dependable method of producing lesions in animals which resemble the chronic ulcer in man is that devised by Mann at Rochester. Mann and Williamson[7] and Morton[8] have shown beyond any reasonable doubt that at least one of the most important factors in the prevention of healing of the chronic ulcers is the chemical irritation produced by the gastric juice. All surgical procedures (gastroenterostomy, pyloric occlusion, jejunostomy) which do not treat the ulcer directly are designed to lessen the mechanical and chemical irritation caused by the acid gastric contents. This is the most important factor to be combatted in any indirect method, medical or surgical, or combined.

I firmly believe in the judicious use of alkalis. A prescription for alkalis does not constitute the medical treatment of ulcer (Alvarez[9]). There is no question concerning the ill effects produced when the alkalis are used carelessly or excessively. Elsewhere[10] we have reported a rather extensive study of the blood chemistry and untoward symptoms occurring in such cases. Sodium bicarbonate is much more likely to produce alkalosis and renal damage than the other alkalis now in common use.

The neutralizing value of a soft acid-controlling diet is too well known to require emphasis. If the use of frequent feedings (Alvarez, Sippy, Coleman, Lenhartz, etc.) has any merit in the so-called medical ambulatory management, it is just as rational when the ulcer has been treated by any of the indirect surgical procedures, such as gastroenterostomy.

Clinical experience as well as experimentation make us believe that focal infections are important in the production of ulcer, its recurrence and its chronicity. I am not convinced that there is a specific ulcer-producing streptococcus. It seems much more probable that the nature of the soil determines the development of a chronic lesion from the accidental acute lesion. The streptococci described by Rosenow, Hayden and others are widely disseminated as emboli, producing many unrecognized lesions which heal. Some of these acute lesions develop into chronic peptic ulcers because of their location where healing is prevented by the action of acid gastric juice. The observations made by Robertson and Hargis of active ulceration in the colon, ileum and jejunum certainly fits with this idea. It is also to be remembered that infected teeth and tonsils are incriminated as the cause of many and diverse diseases affecting practically all the tissues of the body. We firmly advocate the early removal of all such infections because of their potential danger.

There is also a motor factor which plays an important part after the ulcer has developed. This

TABLE 3

Results Of Treatment In Peptic Ulcer Patients

Occupation	Total Cases	Duration of Treatment*				
		Over 1 year	1 year	9 months	6 months	3 months or less
Housewives	21C 6F	5C F	11C 2F	2C	C F	2C 2F
Farmers	17C 5F	2C	8C F	3C F	C F	3C 2F
Laborers	12C 4F	2C F	5C F	C	3C	C 2F
Students	9C 2F	C	5C F	2C	.... F	C ....
Teachers	7C 2F	2C F	2C F	C	C	C F
Salespeople	9C 2F	C	3C F	C	2C	2C F
Business Men	8C 6F	C F	4C 2F	C F	.... F	2C F
Retired	6C 3F	C	2C F	C	.... F	2C F
Office Clerks	6C 4F	2C	3C F	.... F	C	.... 2F
Railroad Men	5C 5F	2C	2C F	.... F	C F	.... 2F
Travelling Men	5C 6F	C	2C F	.... F	C 2F	.... 2F
Carpenters	5C 3F	....	2C F	....	C F	2C F
Engineers	3C	C	C	....	C	....
Editor	C	....	....	C	....	....
Lawyers	3C	....	C	C	....	C
Ministers	2C F	....	2C	....	....	.... F
Miners	C F	....	C	....	.... F	....
Nurse	C	....	....	C	....	....
Physicians and Internes	6C 10F	C F	3C	.... F	C 2F	C 6F
Veterinarian	F	F	....	....	....	....
TOTALS	127C 62F	22C 5F	57C 14F	15C 6F	13C 12F	20C 25F
CHANCE OF CURE						
Per cent cured			80.6	71.4	52.0	44.4
Per cent failed			19.4	28.6	48.0	55.6

Total of 189 cases—27 gastric and 162 duodenal ulcers.

C—Cured.
F—Failure.
*Duration of treatment according to the patient's own statement.

motor disturbance may be a result and not a primary cause. At any event, in the average duodenal ulcer without obstruction the gradient is steepened. This permits the more rapid discharge of acid juice against the surface of the ulcer and interferes with the normal reverse peristalsis and the mixing dilution and neutralization. Obstructive lesions due to either spasm or scar also interfere with the normal protection offered by alkaline duodenal contents.

The healing process goes on rapidly under favorable conditions as shown by Mann[11] and Caylor[12]. For this reason many physicians have been satisfied with the accompanying temporary subsidence of symptoms, the medical "cure" ridiculed by Mayo, Alvarez and many others. Prolonged protection is necessary to completely heal the chronic lesion.

COMPLETE DIAGNOSIS

I wish to emphasize the importance of a complete diagnosis. In the older patients at least a third have other organic abdominal conditions in addition to the peptic ulcer. Chief among these are chronic appendicitis and cholecystis. In our study of the gastrointestinal case we should, therefore, not be satisfied with a mere diagnosis of duodenal ulcer. A diseased gallbladder so modifies the picture that many of these cases should have the benefit of surgery for both conditions. In a number of my own cases the medical treatment of ulcer has failed because of incomplete diagnosis (table 1). We can not always be sure whether the persistent symptoms are due to an unhealed ulcer or in reality due to the other disease. At any rate, with the proper surgical treatment of the associated conditions in some of these cases all symptoms disappear.

Another aspect in the medical treatment of ulcer is coincidental or perhaps associated systemic and constitutional disease. The more important of these are chronic nephritis, cardiovascular-renal disease, tuberculosis, diabetes and chronic arthritis. Their management often requires considerable effort and ingenuity, especially in the adaptation of the diet. The decision in regard to surgical interference in some of these cases is a very large problem. The life expectancy of the patient treated by operation must be carefully estimated. In some cases the surgical risk is not justified.

INDIVIDUALIZATION

Now what specifically do we recommend in the handling of these cases? First of all an accurate and complete diagnosis. No real diagnosis of ulcer is permissible without a careful clinical and x-ray study. The diagnosis must include a visualization of the ulcer, the recognition of all associated abdominal pathology, systemic disease, and localized or so-called focal infection. In short we must know the status of the patient as a whole. This study requires time and effort. There need be no haste except in the emergency complications of this disease. Only after this study is completed do we determine if surgery is to be employed. Whenever surgery offers more prospect and less risk than medical treatment it should be used. I think that eventually almost all gastric ulcers will be considered surgical. After operation, if the ulcer was not excised, the indications for medical treatment remain. Time does not here permit a consideration of the various indications for surgical treatment of duodenal ulcers.

In the uncomplicated duodenal ulcer, where our judgment makes us consider nonsurgical treatment practical, the patient should be put to bed. I insist on this preliminary bed management. There are many misconceptions concerning its purpose and its value. Usually this confinement will not be necessary for more than ten days or two weeks. This is not the "medical cure." Its purpose is to still further study the patient, his response to treatment and his character. We use necessarily some degree of routine but the dietary and alkali therapy are adapted to the patient. In part he adapts himself to the routine. He is taught the essential principles of the management. After ten days, sometimes sooner, we have sized up the situation and may prophesy the results. We have discussed with him his living conditions, the nature and hours of his work, his habits and the various other factors which may have to do with his treatment. Finally he is placed upon exactly the same schedule of feedings and alkalis that he should follow for many months.

And then these questions are put to him. "Do you understand what you are doing and why you are doing it?" "Will you do this carefully for a whole year?" Now, if he says, "Oh, I can't do that" or "I can't work and do that," then together we try a little further to adapt the management to him. We take a day or two more to think it over. Then, if he is not sure that he will follow long and well, it is best to advise him and often to urge him to have the operation. Many patients choose medical treatment without any clear understanding of the situation. Often they are unnecessarily afraid of an operation. A real medical management is radical. When the surgeon and certain internists ridicule "Sippy cures," they are talking usually about an indifferently applied three or four weeks of hospital management and not indicating the same thing that Sippy[13] described and tried to carry out. Some talk about "ambulatory treatment" of peptic ulcer as if they had discovered something new. The term seems out of place to me because ambulatory treatment is a part of all medical treatment of these chronic ulcers, unless you expect to keep the patient in bed for many months.

The diet is liberal and has variety. It is soft, palatable, nourishing and neutralizng. Small frequent feedings are of basic importance. The milk and cream mixture usually forms an important part, chiefly because of its convenient use. Often it is not desirable and certainly it is not necessary. Tobacco must go. Needless to say all of the other abnormal conditions in these patients must be treated. The infections which may have caused this ulcer or which might cause another must be removed early.

Many experienced gastroenterologists warn against prolonged interference with personal liberty in our medically treated cases. They stress the dangers of an anxiety neurosis. The most introspective and apprehensive group of patients in my practice consists of doctors. They have also been the least manageable and the least faithful to a regime. In any chronic disease like peptic ulcer it seems to me that the patient should comprehend the difficulties and some of the dangers. He should have a sufficient understanding of the problem to give faithful and hearty cooperation. The same attitude should be assumed as we have learned in the treatment of pulmonary tuberculosis. Patience and hope, cooperation and determination are necessary for the cure of such diseases. We may well apply the terms "incipient," "advanced" and "arrested" to cases of ulcer. Time is necessary to prove a cure. A short management is nearly worthless. The medical treatment of ulcer must be radical and prolonged if we are to anticipate results.

I have always asked these patients to see me or to write to me every month for at least a year after they begin treatment. I explain to them that I am interested in their recovery and that I want to know exactly how well they are succeeding. They may not report and often only report once or twice. I think that they usually tell what they are doing. Those who report regularly are chiefly those who are "cured" and I think it is because they are faithful in their cooperation.

RESULTS

The end results of medical treatment of peptic ulcer are reported in two hundred ninety-four cases. Of these, ten have died or are seriously ill from other causes and the condition of the ulcer is therefore undetermined. In eleven (or more) the diagnosis proved to be incorrect as shown by subsequent studies. In four out of thirty-nine cases diagnosed as gastric ulcer death occurred from gastric cancer. In three operations for appendicitis cured the symptoms and the evidence indicated that no ulcer was present. Four patients at operation had cholecystitis and the signs and symptoms were probably due to their gallbladders rather than to duodenal ulcers. The study indicated that in at least twelve cases either appendicitis (five cases) or cholecystitis (seven cases) was present in addition to the ulcer. This additional pathology was not recognized when the patients were started on medical management.

Of the two hundred and sixty-one medically treated cases followed after two years, one hundred and twenty-seven (48.7 per cent) have remained free from symptoms and may be termed arrested or "cured"; thirty-five (13.4 per cent) are probably arrested, i.e., are free from symptoms which are definitely attributable to ulcer. Twenty-six have mild abdominal symptoms not indicative of ulcer and not like the symptoms leading to the diagnosis of ulcer, but symptoms which may be due to an unhealed or recurrent ulcer. These are termed as possibly arrested ("much improved").

There were sixteen gastric ulcers and one hundred and seventy-two duodenal ulcers thus fairly satisfactorily managed.

In eleven cases (4.2 per cent) the symptoms were "better" but the replies indicate that the ulcer has probably failed to heal and in sixty-two cases (23.8 per cent) there is undoubted failure. Of this group of seventy-three cases with failure nineteen were diagnosed as gastric ulcers and fifty-four as duodenal ulcers.

An analysis of one hundred and eighty-nine cases, twenty-seven with gastric ulcers and one hundred and sixty-two with duodenal ulcers, which may be classified as either distinct failures or fairly definite cures, indicates that the duration of treatment is an important factor in determining the end result. The occupation probably influences the ability of the patient to follow a strict routine. Cooperation does not seem to be dependent upon intellectual or scientific attainment.

In a report to be made later there will be a more detailed study of the failures and their causes.

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Ureteral Stricture as Complication in Cancer of Cervix. Charles L. Martin, Dallas, Texas (*Journal A. M. A.*, Nov. 17, 1928), says that approximately 80 per cent of all patients with cancer of the cervix treated by all methods eventually succumb to the disease. In this group of cases, strictures of the ureters producing pain and eventually uremia and death are the most important complications.

MYRTOMEL IN DIABETES MELLITUS

THE RESULTS OF ITS USE *

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The purpose of this short paper is to summarize briefly the results of our use of myrtillin in the treatment of a small series of patients with diabetes.

Myrtillin, or myrtomel, as it is now termed, is the active sugar lowering principle of the myrtle family of plants. Wagner[1] demonstrated by the use of blueberry leaf tea this sugar lowering principle in the alimentary glycosuria of dogs and considered that the variable results obtained were due to the presence of a sugar raising substance in the leaves. Subsequently, the former substance was purified and called myrtillin. Wagner with Marks[2] and Eppinger[3] demonstrated that its oral use would lower the hyperglycemia and glycosuria in depancreatized dogs and reduce the glycosuria, and in some cases abolish it in diabetic patients.

The only comprehensive report in English is by Allen[4], who published the results of his work with myrtomel last year and again touched on it briefly in a recent general review of diabetes. The dearth of clinical reports is due to the fact that a policy of careful animal and clinical experimentation was adopted by Allen and the E. R. Squibb Company, preliminary to commercial distribution. Myrtomel was, therefore, supplied to a number of clinics throughout the country on condition that complete data collected on the results of its use in each patient be referred to the manufacturing company for analysis on a broad scale. This work has been going on now for over a year, but myrtomel is not yet on the market, nor probably will it be until more definite proof of its value has been collected.

Myrotomel, as it is now manufactured in tablet form, is a grayish brown substance which is not chemically pure. The active substance has not been isolated. It forms a colloidal solution in water and dilute alcohol. Allen believes that the two substances found in leaves are opposed factors in the carbohydrate metabolism of plants, myrtomel being the anabolic factor. There is some suggestive evidence that it may be related to the vitamins.

The dosage has been empirically determined as 1 gram per day both for patients and dogs. Reduction below 0.3 grams daily results in somewhat less effect, but increased dosage by twenty times produces no more effect than the 1 gram dose. Equally good results have been obtained in animals by oral and intravenous routes.

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* From the Department of Medicine, University of Oregon Medical School.

The effects of the use of myrtomel in dogs, both partially and totally depancreatized, is striking, in fact, much more so than its use in human beings. In normal dogs Allen was able to demonstrate a reduction or complete suppression of hyperglycemia following the giving of large quantities of glucose either orally or intravenously, by giving 1 gram of myrtomel by either route. Moreover, epinephrin hyperglycemia is also reduced in the same way. Because of the continued effect over some period of time after stopping myrtomel, Allen feels that it is perhaps stored in the body. Totally depancreatized dogs seldom live longer than a week after operation, and wound healing fails, but when myrtomel is given, life has been prolonged as much as sixty days, the shortest time being twenty-four days. No loss of strength occurred, digestion was normal by feeding a pancreas preparation and the wound healing satisfactorily. The blood sugar seldom is over 300 mg. and the urinary sugar is low. A few days before death the blood sugar rises, cachexia develops, but insulin, if given in time, will save the animal.

Partially depancreatized dogs characteristically develop a severe diabetes. Allen, by leaving as little as one-fiftieth of the pancreas about the main duct and by giving the dogs myrtomel, was able on a mixed diet to keep the blood sugar normal and the urine sugar free. Shpiner[5] duplicated the work of Allen and arrived at the same conclusions. In addition, he found that the myrtomel given to partially depancreatized dogs reduced the hyperglycemia and glycosuria produced by administration of desiccated thyroid extract.

Myrtomel was used by Allen in eighty-one patients with diabetes. Of these eighty-one patients, twenty-one had to be excluded because of various irregularities, such as infections which lowered the tolerance, and insufficient time of observation. Twenty-four of the remaining sixty were classed as failures because its use over two months time permitted neither a reduction in the insulin dose nor an increase in the diet. In thirty-six patients, however, the administration of myrtomel made it possible to do either or both. In only six patients was it possible to stop the insulin entirely.

Certain fundamental facts peculiar to diabetes must be taken into consideration before starting a clinical investigation in patients with such a disease. If these facts are not kept in mind, an erroneous conclusion may be reached as the result of the application of any given form of therapy. It is a well known fact that an untreated patient with diabetes, put on a weighed, restricted diet, under control, invariably shows a reduction in glycosuria and hyperglycemia, and as these conditions are brought to normal, increase in tolerance for carbohydrate and additional calories is to be expected. If this improvement has been assisted by the use of insulin, a still further and more rapid improvement occurs. Moreover, we have seen increase in glucose tolerance in insulin treated patients develop suddenly after two years of apparently stationary tolerance. Besides this, fluctuation in tolerance from time to time without known cause is frequently seen. On the other hand, such conditions as acute or chronic infections, various degrees of hyperthyroidism, under exercise, emotional upsets, all play a role in reducing the tolerance. The selection of patients, therefore, for such a clinical investigation, must be made with all of these factors in mind. An attempt must be made to use only those individuals of known tolerance, under control for a long time, free from infections, and of stable nervous temperament. Even with these precautions fulfilled, difficulties are encountered.

The slowness and mildness of myrtomel action in human beings as compared with dogs is difficult to explain unless on the basis of there being an intrinsic difference between a true diabetes and one experimentally produced by pancreatectomy. This slow action has made it necessary to desugarize the patient first with restricted diet alone, or by diet and insulin together, as necessity demands, and when the blood sugar has been brought to normal, to begin the oral administration of myrtomel. After a period of ten days or more, a 10 to 20 per cent reduction in the insulin dose is made, followed after a similar period by a blood sugar estimation. If the blood sugar level is still within normal limits, a still further reduction in insulin is made. Allen has found that by the use of this particular method fewer failures have occurred than when an attempt is made to abolish the glycosuria by myrtomel and diet.

Our own experience with myrtomel was made possible through the courtesy of Dr. Frederick Allen and the E. R. Squibb Company. About a year ago it was first given us in quantities sufficient for five patients. Since then a larger amount has been furnished, so that at the present time fifteen patients are using it. Our present series comprised eighteen patients, four of whom have stopped its use because either no definite effect was noted or because various complications arose which made it impossible to evaluate the results. It is, of course, necessary in some patients to continue myrtomel administration a longer time than two months to determine the effect, as various irregularities arise, e.g., an acute infection, which temporarily prevent an accurate analysis of the results.

The ages of the patients varied from six to sixty-four years. Six of the patients were children and twelve were adults. The diabetes was severe in eight, moderately severe in three, and varied from moderate to mild in six. Twelve were taking insulin and four were on diet restrictions alone. The duration of the disease varied from three months to three and one-half years. Myrtomel was used over a period of from one to nine months.

Four children who had been under our care for a period of over two years were selected for myrtomel experimentation with the hope that by its use a certain peculiar response to insulin could be overcome. We refer to the morning hyperglycemia and glycosuria which occur in about 10 per cent of diabetic patients and which cannot be abolished by elevation of the night insulin dose, even though sufficient insulin be given to produce a late evening reaction. It is interesting to note that in these patients the blood sugar taken at other times during the day is normal. The only means by which these individuals can be kept constantly sugar-free is by giving a small dose of insulin after midnight, and it is doubtful whether there is sufficient good accomplished to justify it. Myrtomel had no effect in three of these patients, either in reducing the total insulin dosage or the hyperglycemia. In one, however, a reduction in glycosuria and the insulin dose was definite.

Reduction of the insulin dose was possible in seven patients out of twelve. Of the other five, three patients had the morning hyperglycemia referred to above, two developed an infection, and the results were inconclusive. Insulin was stopped entirely in two patients; one was taking 20 units daily and the other eight units. In the latter, even after stopping the insulin, a rather surprising increase in carbohydrate and total calories was also made. The smallest reduction in insulin dosage was four units and the largest twenty.

Four patients, one with a glycosuria of a few grams daily, which did not yield to weighed diet restriction and three with a moderate hyperglycemia varying from 160 mgm. to 175 mgm., but without glycosuria, had repeatedly refused to consider taking insulin. They readily assented, however, to use myrtomel by mouth, with the following results. The patient with glycosuria became sugar-free and her blood sugar dropped from 200 mgm. to 143 mgm. Three with hyperglycemia after a period of two or three weeks presented normal blood sugars. The action of myrtomel here was somewhat slower than in patients who were taking insulin and myrtomel together.

Ability to tolerate an increase in diet in addition to a reduction in the amount of insulin was noted in nine patients.

A definite stabilization of the blood sugar was noted in three patients who had long been subject to repeated insulin reactions. As Allen states, this response, also noted in experimental dogs, is especially valuable in children who are particularly prone to develop hypoglycemic attacks, but it must be remembered even when a sufficiently excessive amount of insulin is given, violent attacks occur despite the myrtomel. The administration of the tablets alone never results in hypoglycemic reactions.

Allen emphasizes the fact that the duration of the myrtomel effect is indefinite. Even though its use is stopped for a few doses or for a few days, the continuance of effect persists. These facts point to its possible storage in the body and point to the possibility that it may be a vitamin-like substance. Absolutely no evidence of toxicity, either subjectively or objectively, has been noted even with large doses, this in marked contrast with synthalin.

Finally, emphasis must be placed on the facts that myrtomel is not insulin and cannot as yet replace insulin, and that it has no value at all in a diabetic acidosis. Much more work is still to be done and much more proof remains to be furnished before myrtomel can be accepted as a routine measure in diabetic therapy.

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Identity of Urinary Proteins of Nephritis. Experiments made by William H. Welker; Edmund Andrews and William Thomas, Chicago (*Journal A. M. A.*, Nov. 17, 1928), seemed to show that in nephritis the blood proteins in the urine either have absorbed, or hold in definite chemical combination, some lower protein cleavage products. The idea is suggested that possibly the elimination of blood proteins can be explained on the basis that the body uses this means for detoxifying the split protein products and then the kidney removes them from the blood because they now resemble in part foreign proteins.

A UNIVERSITY HEALTH SERVICE AS AN EDUCATIONAL FORCE FOR SCIENTIFIC MEDICINE *

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The medical profession in the past has been so exclusively interested in the discovery and application of new scientific facts that it has failed frequently in rendering the best service to the community because so few people really appreciate the service they could and should receive from a physician. Various cults have capitalized this general ignorance and their freedom from the exacting pursuit of truth has given them leisure for a propaganda which has been all too successful in gaining widespread credence in their quasi- or pseudoscientific pronouncements. While most physicians are too busy keeping up with their profession to take an active part in acquainting the general public with the advances of scientific medicine and probably still look with disfavor upon personal advertising, yet it is a fact recognized more and more frequently that the profession is not without obligation to the commonwealth in the development of a more common appreciation of the claims of scientific medicine. It is this particular aspect of the work of a university health service that will be dealt with in this paper.

The educational value of such a service though tremendous is little appreciated even by members of the medical profession. The formal courses in personal hygiene required of freshmen are given by members of the staff or by those in close touch and in sympathy with the Health Service. In addition to this formal classroom education is the indirect but constant opportunity afforded in consultation to stress the need for hygienic living and to emphasize the value of scientific medicine in the prevention and cure of sickness.

Fortunately the day is past when the burden of securing recognition for this educational work rests entirely with those actively engaged in health work. As an illustration of the attitude taken by progressive educational administrators today we may cite a recent example near at home. In February of this year, Dr. M. Lyle Spencer in his installation as president of the University of Washington, seeking as he says to erect a "rock basis on which to build a structure for undergraduate education that will meet the needs of the youth of our state," states, "I put health first because it is fundamental to success and happines in life. We may garner the wisdom of the ages, but if we have not health, our lives become a curse to ourselves and often a menace to those of others." Could a physician make a stronger statement and does not the recognition of the prime position of health in a university program by university leaders offer a golden opportunity to develop in the leaders of tomorrow a consciousness of the high place scientific medicine should occupy in the community? Here indeed we find a wide open door and if we physicians will but enter, our opportunity is unbounded. In our own state university the support given to health work for the students is unequivocal.

The writer is aware that there are those who are frankly hostile to almost all health educational work and certainly he is not unaware that at least some health workers are, to put it mildly, not aiding the advance of scientific medicine. Whether we like it or not the public is demanding education in health matters and all through our school systems health occupies a prominent place in the curriculum. As our executive secretary has ably pointed out on numerous occasions we need a constructive rather than a destructive policy; that is, we must supply a positive program.

Are we going to leave to social workers and to nonmedical teachers the entire problem of health education? In the universities not only are hygiene and sanitation taught but students are trained to take an active part in health work as teachers and social workers. Probably every physician who has practiced for some time has been irked by the misdirected zeal of some social worker or teacher who did not realize his or her place. Probably, too, every lay worker in the cause of better health has been exercised by the obstructionist methods of some few physicians who are not in sympathy with any change and who do not realize that evolution in medicine is as inevitable as it is in nature. Is it not the part of wisdom to try to control rather than to prevent this change?

But at once there will be those physicians who will state that they do not object to formal classroom work but to the actual caring for the sick that most health services advocate. Such men would not object to a physician acting as a general sanitary supervisor, for examining students to determine their types of physical activity, and for examining and isolating those who suffer from contagious diseases. When pressed these same men will usually offer no objection to service being rendered to

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those financially unable to pay a doctor's fee. That would no more be possible than to charge tuition in accordance with the ability of the student to pay. Indeed, in the democratic community of a state school, independent students, no matter how indigent, would hesitate to use a service organized on such a basis. As a matter of fact, over 60 per cent of the students on the campus of the University of Oregon support themselves in part or in whole. Furthermore, the physician who believes his practice is unjustly decreased may be glad to learn that by far the majority of calls at a university dispensary are for trivial conditions—boils, cuts, colds, and kindred ailments—which would never be called to the attention of a private physician.

Indeed, it is in this very direction that the University Health Service can be signally helpful to the medical profession, for it is inculcating the habit of frequent early use of a physician. Nowhere is there such a golden opportunity to preach the doctrine of "a stitch in time." If university students when sick will patronize the drug clerk or "let nature take its course," they will follow the same procedure after they leave the university. But if they can recognize from experience that early consultation with a physician is expedient, then this habit acquired in college will become one of their chief gains and certainly will add to the profit and, what is more important, to the success of the general practitioner.

Furthermore, as students with a slight fever are urged to go to the infirmary, they learn there the benefits of early hospitalization in relatively slight ailments. All of us know how difficult it is to get our patients to recognize the value of hospitalization for all except the most intractable cases. A student who has been in the infirmary with the grippe, or with a lymphangitis, or possibly simply to get some comfort from a severe poison oak dermatitis, will be able to appreciate the suggestion of his physician in later years who advises him to go to a hospital for observation. He will not regard the hospital as a place to go only after death is threatented, a last resort where he may be saved if he is fortunate.

Nor is it true, as some believe, that this service is maintained for only a small minority of the students. In each of the past two years over 70 per cent of the total student enrollment, including those who were on the campus for one term only or in fact for one week only, did make at least one call at the dispensary and over fifteen thousand calls were made each year. These boys and girls come entirely of their own volition. Contacts are made and questions are asked and they are encouraged to investigate. Because they have something wrong and are themselves seeking for help they are in a mood really to learn. It is surprising, for instance, how frequently questions are asked about various cults. Such a questioner will frequently listen to a university physician as he will not attend to a physician whom he may suspect as being influenced by a desire for a fee. If such a student can be shown that modern medicine is not a jumble of opinions but a science resting upon the sciences of chemistry, physics and biology which he is studying, he will be much more apt to be sympathetic toward medicine. If he gets the conception of the doctor as truly a learned man, as the term signifies, as one who spent many years learning before he tried to do, as a scientist whose one demand in his search for truth is proof, then the physician need not fear that that student will later consult one whose only scientific training is in high pressure salesmanship. Certainly it is not claimed that through the Health Service alone is the value of medicine taught. However, it is believed that its contribution in this respect is frequently underestimated, especially since it gives not only a medium for expression but actually helps in the inculcation of habits.

There should of course be no question of competition between the Health Service and private physicians. Those students who find it possible and prefer to consult their own physician should be given every encouragement to do so, and the Health Service is more than glad to cooperate with physicians throughout the state either in the continuation of a given type of treatment or in the reporting of progress to the student's physician. We insist that a statement from any physician for temporary absence from classes shall be accorded exactly the same consideration that such a statement issued by the Health Service receives. We are more than glad to call in any consultant whom the patient or responsible relative may desire.

The fear that a service of this sort is a step toward state medicine is, I feel quite sure, altogether unfounded. In a study made in Illinois in 1923 upon the use made of the medical profession by five thousand persons in various economic groups, only 7 per cent were in the habit of calling a physician when sick. The other 93 per cent, unless they were about to die, patronized the various cults, took patent medicines, or "let nature take its course." Does the danger that citizens will vote to support with their taxes a profession which is used by only 7 per cent of their number not appear remote? Furthermore, is it not true that a liberal policy toward public health problems on the part of the medical profession is the best insurance against any agitation for state medicine? It is our earnest belief that there is no better way to forestall such a calamity than by sending out through the state men and women in sympathy with the aims and practices of the medical profession, who would see the tremendous disadvantages of such a system.

Now it is at once the duty and the opportunity of the University Health Service to foster such a sympathy with the aims and practices of the medical profession, in order to aid in bringing about a better understanding of scientific medicine. Particularly is to be sought a closer cooperation between all of those interested in promoting better health. How can the University Health Service help in this necessary adjustment? In the first place its staff members as instructors can and do point out in hygiene classes and in those special classes of students who are training to take an active part in health work, the proper limitations of lay workers. Of those engaged in caring for the sick the physician alone has been trained in both the fundamental sciences and in clinical medicine. The science of medicine is not limited to drug therapy but to every method which bears the critical light of research and while many of the cults may have a modicum of truth in them they depend not upon carefully controlled experimentation or observation but upon opinions, many of which are at variance with simple well known scientific facts, and none of which have been proved by careful investigation. Unless physicians themselves will call attention to these things, they are in grave danger of being unrecognized.

But much more important than any formal classroom instruction in insisting that diagnosis and treatment are and must always remain the problem solely of the physician, is the practice of the principle in the University Health Service. Before ever students are registered they are given a complete physical examination, the findings of which are used at once in helping the new student adapt himself to his new physical, social and mental environment. Perhaps for the first time he appreciates the desirability of a careful physical inventory, and the determination of his activities in accordance with his physical limitations under proper supervision. When, as at Oregon, the coaches of the athletic teams, the instructors in physical education, and those interested in training workers in health education, insist that their students report to and follow the instructions of a physician they are showing their faith in the belief that sickness should be diagnosed and treated only by a physician. But only through a health service maintained on the campus can this be done persistently and consistently.

If the University Health Service is to do this educational work well, it must command the unqualified respect of its students. The staff members must be not only adequately trained but they must be alive to the tremendous educational possibilities of the work which must be made attractive enough to prevent continual change in the personnel. Proper facilities in the way of consultation and treatment rooms, adequate equipment including such aids as x-ray, physiotherapy and laboratory apparatus, records comprehensive enough to be useful in research work, all these are necessary if the service is to be not only of immediate remedial value in the lives of the students but a real dynamic department of a progressive university. If students are to leave us with respect for the service they received we, too, must have available modern methods of precision.

It is not, therefore, with the hope that we may some day establish a clinic that will be a model for physicians of the state to aim at, that we are constantly calling attention to our needs for modern buildings and equipment. Rather it is that, in our attempt to give to students an appreciation of the method of approach of the modern physician as a scientist to the problem of health, we recognize the necessity of following, so far as is possible, the progressive members of the profession who are ever striving to give better service. We are not aiming at a service which we may proudly point to as the type of service the future citizen shall demand from his physician. Rather we are striving to give a service which medical men throughout the state will not be ashamed of; a service that will give some appreciation of the rightful claims of modern medicine. We appeal to you for support in making the Health Service one of the strong departments of the university because of the splendid opportunity it affords in positive health. It is strategically situated to reach the community leaders of tomorrow and so can, in part at least, meet the need for more widespread knowledge on health matters, for a better understanding of preventive measures and for a keener appreciation and more widespread employment of the advantages of early diagnosis and scientific treatment. For such a program we unhesitatingly ask your support.

NORTHWEST MEDICINE
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EDITORIAL

THE COURAGE OF EQUIPMENT

Dr. A., the pediatrician, is one of the best equipped medical men in the regional profession, both as to training and perquisites. But he is morbidly sensitive to his responsibilties. He meets one with an anxious frown, almost with an air of guilt. He says, "I lost another baby last night." However, inquiry reveals that this lost baby was an infant of seven precarious days, born with a cardiac dextraversion and a massive meningocele. Everything possible was done; there could have been no hope for it; no skill could have saved it, and it was better early dead in any event. Yet this is the fibre of the stuff of our friend's sleepless nights.

Another friend is the optimistic B., a rising young "general specialist" with more spirit than experience. He greets one with a morning smile of apparently well earned satisfaction. There was a man who blistered his heel, the blister broke and there followed redness, swelling, pain, red lines, popliteal glands, and finally (oh horrors!) elevated temperature. B. put the patient to bed and administered untold millions of safely dead streptococci into an innocent and unsuspecting gluteus maximus. The patient got well in spite of the omission of the hot poultices, forced fluids and other time honored if antiquated methods. It was a triumph for B. and the serum. In his optimistic young mind there was a life saved.

These are rather the extremes. We are taught that we must find a philosophic mean with which to meet the tragedies of our practice. Yet all the teaching gleaned from all the philosophy of the world is not going to take the bitterness from such moments, when an honest analysis reveals to us a crying inadequacy in our equipment. In restrospect it is easy for B.'s type to slough their responsibility. For most of us, though, there must be moments of bitter self-analysis.

What is the answer to the conscience of the man like A.? The answer is this. *He needs the courage of equipment.* He has prepared himself for his high calling. He is ready to bring into play a trained intelligence and a technical skill far above the average. His fault, then, consists in not seeing that his own adequacy should form a fair part of his professional psychology. His voice should be that of the massed achievement of many, concentrated by his study and experience into personal authority. His confidence in his ability should form the strong wall, against which his petty phobias can dash helplessly. Failing this, his psychology will always be morbid. It is such introspective types who, lacking the background of adequate equipment as a saving grace, shoulder their responsibility even more heavily than A., and not seldom stagger off into withering paths of artificial self-forgetfulness, liquor and dope.

And what about the optimistic B.? He lacks the humility of wisdom. He is quick to judge, yet lacking in judgment. He has the mind with the logic-tight compartment. What he has done is right because he happens to have done it. A pleasing personal philosophy, we grant, but pernicious in its outward application in medicine. To B. and his ilk we suggest diligence in the pursuit of adequate equipment, and the assumption of modest deference toward the sadder but wiser A.

MEDICAL CONFERENCE OF STATE SECRETARIES

The annual medical conference of secretaries of state associations and editors of journals was held Nov. 16-17 at the American Medical Association Building, Chicago. Representatives were present from nearly all of the state associations and association journals. The Pacific Northwest was represented by Drs. C. H. Thomson and J. N. Davis, respectively secretaries of the Washington and Idaho associations; Mr. Clyde C. Foley, executive secretary of the Oregon society and Dr. C. A. Smith, editor of NORTHWEST MEDICINE. There are twenty-nine association journals published, most of them representing one association, with a number combining two or three associations. Thus, with one or two exceptions, all of the state associations have medical journal representation.

The purpose of these annual meetings is to discuss matters of common interest in all the states, and by the exchange of views to pass on to each state association through its secretary such suggestions as may be of benefit in the conduct of its affairs from year to year. Likewise, the journal editors have the benefit of the exchange of views in journal management which may enable them to increase the value of their publications for the benefit of their constituents. Not the least interesting feature of these meetings is the personal touch with men representing every state in the union. The comparatively few men in attendance permit a more personal contact and exchange of views than is possible in the large national conventions. These meetings are held under the auspices of the American Medical Association for the purpose of obtaining results, some of which are outlined above.

FUNCTION OF THE COUNTY SOCIETY

At the recent Chicago conference of state association secretaries, much time was devoted to the discussion of the county society. The societies in the larger states, including many members, are in a flourishing condition and have no difficulty in carrying on their periodical meetings with a good attendance of their members. Many of the smaller societies, however, are in a more or less chronic state of inactivity or somnolence. This situation is not peculiar to one state or section of the country. It was interesting in the discussion of this subject to note the unanimity of experiences as offered by speakers from every section. The question is how to keep alive the county society covering a wide expanse of territory, with scattering population and few physicians, for the most part located long distances from one another. Some of these societies meet once a year for the purpose of electing officers and to keep their organizations alive in order to maintain membership in their state and national organizations.

A common criticism is that the county society is frequently subordinated to hospital staff meetings which are well established in most of the states and which monopolize to a large extent the time and attention of the local practitioners available for scientific meetings. To meet this situation it is proposed that at stated intervals the hospital and county meetings be combined, so that the identity of the county society may be thus maintained and its regular meetings be recorded. The details of such union meetings would be worked out according to local conditions. The combined meeting of two or three adjacent small societies is commonly practiced in all the states. The advice was given that in such joint meetings the individuality of each county society should be recognized and not lost in the common organization. Various suggestions were offered for increasing the interest of the members in their society meetings. The opinion was unanimous that the county organization should not be permitted to die. It is the unit which is the basis of the state and national organizations and consequently its existence should be fostered by all possible procedures. Different state officials were highly commended who follow the practice during their terms of office of visiting their county societies in person or by an official representative. In the smaller states this is easily accomplished, but in some of the states, with a large number of counties, it is a difficult and burdensome undertaking. As is true in all situations in life, where troublesome experiences are encountered, benefit results from unburdening one's mind and comparing notes with one's fellows who are experiencing similar difficulties. This is one reason why such meetings as this are worthwhile.

THE PORTLAND A. M. A. MEETING

The meeting of the American Medical Association at Portland next summer will be an outstanding opportunity for the profession of the Northwest to attend this great annual convention, which will not again be scheduled at their doors for a period of years. Everyone who will be able to do so should make his plans early to attend this meeting. During the ensuing months it will be the purpose of this journal to offer its readers information with each issue relative to plans for the meeting and various features as they will be perfected. The local committee is busily engaged in arranging all the details and whenever they are available they will be presented for the benefit of the profession served by this publication.

THE JULY A. M. A. MEETING AT PORTLAND

Plans for the 1929 A. M. A. meeting, to be held in Portland July 8-13, are now well under way under the leadership of Dr. E. A. Sommer, chairman of the Local Committee of Arrangements. The city was honored early in September by a visit from a group of the headquarters staff of the A. M. A., including Dr. Olin West, Secretary and General Manager; Dr. Rock Sleyster of Milwaukee, Trustee; Dr. Paul N. Leech, Director of the Scientific Exhibit; and Will C. Braun, Business Manager. The trip was in the nature of a preliminary survey of Portland's facilities for handling the meeting. Judging from the enthusiastic feeling of Dr. West and the other men after seeing the city and its accommodations, there is no doubt in their minds that the meeting can be cared for in an acceptable manner.

At a dinner meeting at the University Club, given in their honor by the officers of the Portland City and County Medical Society and the Oregon State Medical Society, the visitors expressed very generous approval of Portland. Dr. Wilson Johnston, president-elect of the Oregon State Medical Society, Dr. Richard B. Dillehunt, dean of the University of

Oregon Medical School, and Dr. Joseph A. Pettit, Trustee of the A. M. A., spoke briefly, welcoming the visitors and the A. M. A. to Portland and pledging the united support of the medical profession.

Although the plans for meeting places are not completely made, it is likely that the House of Delegates will meet at the Hotel Multnomah, Portland's largest and one of its finest hotels. Registration and the scientific and technical exhibits, as well as a number of the scientific sections, will be housed in the Municipal Auditorium which is only a short distance from the Hotel Multnomah. The Auditorium is admirably suited for exhibit purposes and many food, automobile and other exhibits have been held there. The city council has generously granted the free use of the building during the session. Other scientific sessions will be held in Portland's new Masonic Temple which is located near the Auditorium. Dr. West said that the Temple is the finest building of its kind that he has seen. Special cab and bus service will be provided between the Hotel Multnomah, the Auditorium, the Masonic Temple and other downtown points.

Physicians throughout the country are already manifesting interest in the Portland meeting. Many have signified their intention of bringing their families with them and combining attendance at the meeting with their annual vacation trip. Requests for hotel reservations have already been received from the states of California, Illinois, Indiana, Iowa, Massachusetts, Michigan, Missouri, Nebraska, New York, Ohio and Pennsylvania.

A number of interesting facts regarding Portland's hotel facilities have been presented by the Oregon Hotel Men's Association. A recent survey made for the Local Committee of Arrangements shows that there are fifty-six first class hotels with a total capacity of 7,039 rooms, 4,258 of which have baths. Portland's hotel facilities are thus far superior to most other American cities of equal size. The hotel men are confident that the thousands who will attend the meeting will be well provided for.

MEDICAL NOTES

Twenty-fifth Anniversary. The Pottenger Sanatorium, Monrovia, Calif., will celebrate, on December 5, the twenty-fifth anniversary of its opening. Ex-patients and many friends of the institution have been invited to attend a reception from eleven till two o'clock. At twelve o'clock a buffet luncheon will be served on the lawn. In the evening a dinner will be given to former associates and assistants, to the members of the Trudeau Society and other local physicians. The dinner will be followed by a program.

OREGON

New Psychopathic Hospital Needed. In his last biennial report which was recently made public, Dr. R. E. Lee Steiner, of Salem, superintendent of the Oregon State Hospital for the Insane, has brought attention to the early need for additional facilities for the care of insane persons. Both the Salem and Pendleton institutions will be filled to capacity by 1930. He recommends the early construction of a branch psychopathic hospital in the Portland district. He also points out the harmfulness of the present practice of confining to the state hospital criminals who have escaped penitentiary imprisonment on the plea of insanity, and recommends that a ward for the criminally insane be added to the Salem prison.

Veterans' Hospital Near Completion. The new $1,350,000 United States Veterans Hospital, now under construction in Sam Jackson Park, Portland, is rapidly nearing completion. According to a statement recently made by Kenneth L. Cooper, regional manager for the Veterans Bureau, it is expected that patients will be admitted to the new institution by the first of the year.

New Hospital at Klamath Falls. Construction is in progress on a new two story, fifty bed hospital at Klamath Falls. It is being built under the direction of Dr. George H. Merryman and his associates, who will operate a first class private institution for the care of medical and surgical patients.

Women's Medical Auxiliary Organized. A woman's auxiliary to the Portland City and County Medical Society has been formed by wives of the members. Officers of the new organization are: President, Mrs. Charles E. Sears; first vice-president, Mrs. Raymond E. Watkins; second vice-president, Mrs. Carl Matzloff; secretary, Mrs. Homer T. Coffen; treasurer, Mrs. C. D. Bodine; auditor, Mrs. J. C. Lunsford. The women's auxiliary expects to take an active part in the entertainment of visiting physicians and their families during the American Medical Association convention next July.

Professional Building Planned. A group of Roseburg physicians and dentists have formed the Medical Arts Corporation, for the purpose of erecting a modern professional building in that city. The new structure, which will be known as the Medical Arts Building, is to be three stories in height and will contain a central laboratory and a garage. Construction is expected to begin early in January.

Swedish Specialist is Visitor. Dr. Elsa Logergren of Gothenburg, Sweden, assistant director of a children's hospital in that place, was a recent visitor in Portland. She is one of the foremost Swedish authorities on tuberculosis in children.

Noted Bacteriologist Lectures. Dr. F. D'Herelle, professor of bacteriology at Yale University, New Haven, Conn., addressed the Portland Academy of Medicine Nov. 8. The subject of his address was "The Treatment of Chronic Infectious Diseases with Bacteriophage."

Date of State Meeting Determined. Officers of the Oregon State Medical Society, at a meeting at Portland Nov. 7, decided to hold the next annual meeting at La Grande May 16-17.

Central Willamette Medical Society, at the November meeting in Eugene, was addressed by Dr. C. J. McCusker and Dr. Laurence Selling of Portland, who spoke respectively on the subjects, "An Analysis of One Thousand Prenatal Clinic Cases" and "Changes in Our Views of Neuroses."

Portland City and County Medical Society met Nov. 7 at the Portland Women's Club. Dr. Homer P. Rush read a paper on "Hypothyroidism and the Heart." Dr. Thomas M. Joyce discussed "Ulcers and Cancer of the Stomach."

Elected Regent. Dr. Ernest A. Sommers, of Portland, has been elected Regent of American College of Surgeons in place of Dr. James B. Eagleson, of Seattle, deceased.

Dr. Everett Boylen, a native of Portland, who has been engaged in practice in Albany, New York, has become associated with Drs. Homer T. Coffen and H. P. Rush of Portland.

Dr. A. W. Tiedeman of Baker is convalescing from an operation performed recently at St. Elizabeth's Hospital.

Dr. Ray Oldenburg, formerly of New York City, has joined the staff of the Klamath Valley Hospital at Klamath Falls.

Dr. Ben Roseman of Boston, Mass., has engaged in practice in the specialty of eye, ear, nose and throat work at Ashland.

Dr. L. T. Brock has opened an office at Klamath Falls.

Wedding. Dr. Walter H. Miller, Clackamas County and city health officer, and Miss Martha Alder, county health nurse, both of Oregon City, were married at Portland Oct. 25.

WASHINGTON

Hospital Plans Approved. Following plans announced recently by retiring King County commissioners to award immediately the contract for the new $2,750,000 City-County Hospital, officers of King County Medical Society, together with local women's clubs and other civic organizations, determined upon vigorous measures to prevent too hasty action in the matter. As the result, Dr. David C. Hall, president of the medical society, on Nov. 20 instituted injunction proceedings against County Commissioners Frank H. Paul and James M. Sparkman, restraining them from awarding the contract at a figure which, it is claimed, is at least $25,000 too high. The petition for injunction also claimed that construction should be delayed until a survey of the hospital needs has been made by a recognized expert. The medical society has already arranged at its own expense to bring to Seattle for this purpose, Dr. M. T. McEachern of Chicago, Ill., secretary of the hospital committee of the American College of Surgeons. The petition also stated that the county commissioners had violated an agreement with officers of the King County Medical Society not to proceed with hospital plans before reaching an agreement with a special hospital committee appointed by the society. Presiding Judge Adam Beeler issued a temporary restraining order and arranged for a hearing at a future date.

Dr. D'Herelle Lectures. Dr. S. F. D'Herelle, professor of bacteriology at Yale University, New Haven, Conn., whose claims to the discovery of an ultramicroscopic living parasite of pathogenic bacteria have received world wide attention, was the guest of the Seattle chapter of the Society of American Bacteriologists Nov. 9. At a meeting of the society, to which members of the medical profession were invited, he gave an illustrated address on the treatment of bacterial infections by the "bacteriophage."

Hospital Burned. The old Anacortes General Hospital at Anacortes was burned to the ground Nov. 16. Patients were safely removed from the burning structure. The loss of the institution makes imperative the need of Anacortes for a modern hospital building.

Addition to Hospital Opened. The new $300,000 addition to the Virginia Mason Hospital, Seattle, Wash., was formally opened Nov. 1, which practically doubles the capacity of the institution. Following the dedication exercises, a banquet was held, at which Dr. J. Tate Mason acted as toastmaster.

New Hospital Under Construction. Work on the new Clark General Hospital at Vancouver, is now in progress. It is expecte dthat the new institution, which is designed to house fifty patients, will be ready for occupancy in February.

Hospital Rooms Endowed. Through the generosity of the late Jane Tyrell Ziegler of Spokane, five rooms in St. Luke's Hospital have been completely furnished and decorated. Each is named in memory of a member of the Ziegler family.

Woman Physician Honored. Dr. Mabel Seagrave of Seattle was made a fellow of the American College of Surgeons at the last annual meeting of that organization. She is included in the group of only thirty women who have been elected to membership and is the first woman representative from Seattle to be so honored.

Marine Officer Transferred. Dr. S. A. DeMartini of the United States Marine Hospital at Port Townsend has been ordered to the Marine Hospital at Boston.

Dr. H. Jackson Capell, a graduate of the University of Oregon Medical School and until recently the resident physician at Edgecliff Sanatorium, Spokane, has located for practice in Pasco.

Whatcom County Medical Society met in the American Legion Hall at Ferndale Nov. 5. Local physicians furnished the scientific program, case reports being read by Drs. C. S. Hood of Ferndale and C. C. Hills of Custer.

Wedding. Dr. Roll Newell Dillon of Seattle and Miss Marion Flint, formerly of Boston, Mass., were married in Seattle Nov. 8.

IDAHO

Monument to Physician Unveiled. In November of 1924 Dr. Wilson A. Foskett, a veteran practitioner of Whitebird fell asleep at the wheel of his car and was drowned when the machine plunged into the Salmon River. The accident was attributed directly to overwork and loss of sleep in the course of his professional duties. On Nov. 4 a granite monument in his memory was unveiled at the place of his death by his widow and son. The Rev. J. O. Du Pont, together with citizens of the community, was instrumental in causing the erection of the memorial, the stone for which was furnished by the state of Idaho.

Hospital Annex Opened. The new $350,000 addition to St. Luke's Hospital, Boise, was formally dedicated Oct. 24. Three thousand visitors were present on the opening day, the majority of whom had contributed to the latest civic enterprise. The new building is up to date in every particular and is thoroughly equipped with modern diagnostic apparatus, including an electrocardiograph.

Joins Veterans' Hospital. Dr. Charles A. Kearney, formerly attached to the United States Veterans' Hospital at Knoxville, Iowa, has been transferred to Boise, where he will act as specialist in internal medicine at the local veterans' hospital.

Veteran Physician Retires. Dr. N. R. Wallentine of Sandpoint, one of the most prominent physicians of Northern Idaho, has disposed of his practice and has moved with his family to San Diego, where he will make his future home.

Dr. N. A. Olsen, formerly of Boise, has taken over the practice of Dr. Roscoe C. Ward at Cascade.

OBITUARIES

Dr. Albert P. McCluskey of Buhl, Idaho, died Nov. 26, aged 49 years, from cerebropsinal meningitis. Two days previously he attended a patient with this disease, from whom his infection was probably contracted. He was born in Oil City, Pa., in 1877. For two years he studied medicine at the University of Michigan, later graduating from the medical department of the University of Colorado in 1906. He began practice at St. Maries, Idaho, and in 1908 moved to Buhl where he was associated with Dr. Charles Wetherbee. During the past six years he has served as mayor of the city. He was active in church work and in commercial clubs of the city. He had a wide acquaintance and a large practice with hosts of devoted friends.

Dr. Oliver Perry Low, Portland, Ore., a pioneer physician, died at his home Nov. 9, following a long illness, aged 66 years. He was born at Lowdell, West Virginia, in 1862, and came to Oregon with his parents in 1889. After serving for several years as principal of Portland Heights School, he entered the University of Oregon Medical School, graduating in 1896. He practiced for a time at Independence and at Arlington, later settling in Portland. For the past fifteen years he had divided his time between the city and Milwaukie.

Dr. Howard Hamilton Smith, Yakima, Wash., died suddenly in that city Nov. 7, aged 61 years. He was born in Wooster, Ohio, in 1867, and graduated from Cleveland University of Medicine and Surgery, Cleveland, Ohio, in 1895. Following his graduation he located at Bucyrus, Ohio, where he practiced until 1918, when he moved to Yakima. He became city and county health officer of Yakima County, a position he held until about a year ago, when he was forced by ill health to retire.

Dr. William Everett Brownell, Elgin, Ore., died at his home Nov. 5, aged 86 years. He was born in 1842, and graduated from Bennett Medical College, Chicago, in 1875. He had practiced in Elgin for the past thirty-eight years. He served in Battery G of the light artillery during the Civil War.

Dr. Royal A. McClure, Seattle, Wash., died at his home Nov. 11, aged 62 years. He graduated from Northwestern University Medical School, Chicago, Ill., in 1893. He had been in practice in Seattle for many years, where he was active both in professional and charitable work.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., D. C. Hall; Secty., C. W. Shannon

The Medical Section of King County Medical Society held a meeting in the auditorium of the Medical-Dental Building, Seattle, Nov. 12.

Dr. L. L. McCoy gave an address on what the general practitioner should learn from examination of the ocular fundus. The eye is the easiest organ in the body to examine. The ophthalmoscope will often indicate first symptoms of various cerebral and general diseases. By lantern slides the speaker illustrated various anomalies and pathologic conditions, describing their relations to the disease with which they are associated.

Dr. J. E. Clark gave a talk on adenoids in adults, mentioning the conditions of disease in which these are a factor. Adults with nose and throat troubles have hypertrophied and diseased tonsils. The adenoid tonsil may be equally guilty as a focus of infection. Drs. Hofrichter and Stillson discussed these two papers.

Dr. N. W. Clein presented a case of congenital diaphragmatic hernia in a female of six months, with irregular vomiting since birth. He described the basis of diagnosis, including radiograms. Results of autopsy were presented.

The Surgical Section of the society held a meeting Nov. 19, with 150 members present.

Dr. Conrad Jacobson gave a paper on "Anatomic and Surgical Factors in Biliary and Pancreatic Disease." Surgery in these cases is of difficult type and secondary operations result from technical errors and overlooked pathology. Pathologic conditions often encountered in the right abdominal quadrant were discussed. The abnormal course of blood vessels, biliary ducts and other organs was emphasized. The anatomy and pathology of the gallbladder were considered and its relation to other organs in that part of the body. The relation of the streptococcus to chronic cholecystitis was considered. The relation of bloodborne infection by way of lymphatics was discussed in relation to the appendix, gallbladder and duodenum. The paper was discussed by Dr. E. O. Jones.

Dr. E. H. Smith presented a patient who for eleven months had been treated by an osteopath for strained knee ligaments. The diagnosis was established of periosteal sarcoma, followed by high thigh operation.

The following resolution, presented by President Dr. David C. Hall, was unanimously adopted:

To the Honorable Board of County Commissioners,
County-City Building,
Seattle, Wn.

We beg leave to present to your body the following resolution, unanimously adopted by King County Medical Society:

Whereas, King County Medical Society has been assured by the existing County Commissioners that no decisive action toward the erection of King County Hospital would be taken without its approval and advice; and

Whereas, this promise and assurance was given in recognition of the said Medical Society's earnest and continued sponsorship of the hospital building movement, and in recognition of the expert advice secured by R. G. Brodrick who was employed to make a survey by the Society, by voluntary subscriptions of its members; and

Whereas, the erection of such a hospital has a vital bearing upon the health and general well-being of the city and county as a whole; and

Whereas, the faulty planning, construction or location of such a hospital would mitigate against its potential usefulness; now therefore, be it

Resolved: That King County Medical Society, by unanimous vote, request said King County Commissioners not to select a site for the institution, nor employ an achitect or architects, until—

(1) The site shall have been approved by a medical expert approved by King County Medical Society; and

(2) Those architects desirous of employment as the designers and erection supervisors of the said building have been permitted to present their qualifications for such employment at a public hearing, at which the Medical Society will be accorded a representation and hearing.

(Signed) David C. Hall, President.

KLICKITAT-SKAMANIA COUNTIES SOCIETY

Pres., H. F. Collins; Secty., F. B. Zener

Klickitat-Skamania County Medical Society met at White Salmon Oct. 18. In the afternoon a joint meeting was held with the White Salmon Women's Club. Dr. Brien T. King of Seattle spoke on "Goiter." Dr. Marr Bisallion of Portland, Ore., gave an illustrated address on "The History of the Antituberculosis Movement and the Newer Aspects of Treatment of Pulmonary Tuberculosis."

Following a dinner at the Congregational Church, an evening session was held with President H. F. Collins in the chair. Dr. H. F. Brush of Yakima, president of the Washington State Medical Association, gave a short talk on the functions of the state society. Dr. Herbert E. Coe of Seattle discussed "The Causes of Mortality in Appendicitis in Children." Drs. King and Bisallion also spoke.

Dr. John A. Balsiger of White Salmon and Dr. S. H. Hodgson of Stevenson were elected to membership in the society. The next meeting will occur in Goldendale next May.

SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., H. T. Rhoads; Secty., W. J. Bell

Snohomish County Medical Society elected new officers at a meeting held in Everett Nov. 13. Those are: President, Dr. H. R. Secoy; vice-president, Dr. J. Spencer Purdy; secretary, Dr. Albert B. Murphy; treasurer, Dr. M. R. Adams, all of Everett. Delegates selected to attend the State Medical Association convention are Drs. William F. West and M. R. Adams, alternate.

Scientific addresses were given by Dr. C. F. Davidson and Dr. G. L. Closson of Seattle.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., P. J. Gallagher; Secty., R. M. Schulte

Spokane County Medical Society held a meeting at Spokane Nov. 8. Dr. Russell Congdon of Wenatchee was entertained, and discussed "Differential Points Between Heart Conditions and Toxic Goiter." He also discussed fractures of the spine, and the differentiation between appendicitis and renal calculus. Dr. George Anderson of Spokane gave an illustrated address on "Congenital Heart Block."

WALLA WALLA VALLEY SOCIETY

Pres., J. T. Rooks; Secty., C. J. Johanneson

Walla Walla Valley Medical Society held its regular monthly meeting at Walla Walla Nov. 8. Dr. J. T. Rooks, president of the society, acted as toastmaster at a banquet at the Grand Hotel. This was followed by addresses by several out of town guests, including Dr. H. E. Brush of Yakima, president of the Washington State Medical Association; Dr. S. E. Lambert of Spokane, a member of the board of directors of the Washington Public Health League, and Miss Helen Wilcox of Seattle, secretary of the public health league.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Pres., E. C. Wheeler; Secty, A. E. Hillis

A regular meeting of the society was held at Seattle Nov. 2, Dr. W. O. Bell presiding. Minutes of previous meeting were read and approved.

CASE REPORTS

Dr. L. H. Klemptner reported a case of "Sympathetic Irritation" of left eye following enucleation of the right, which had been injured from penetration of a small piece of steel, March 30. Two days later panophthalmia had developed for which the eye was enucleated. A typical picture of sympathetic irritation developed by the end of May. There was no improvement in spite of dionin and salicylates, and glasses for astigmatism. The nerve specialist diagnosed the case as hysteria. It is still unimproved.

Dr. J. A. Weber reported a case of chronic purulent otitis, with odorous, purulent discharge for six weeks, with no pain, tenderness, increase of tem perature nor evidence of pumonary tuberculosis, Wasserman negative, hearing normal. Bony conditions of the canal were described, the radiograph showing bone destruction. Treatment has been without avail. Surgical removal of necrosed bone seems indicated. In discussion, Drs. Wanamaker and Shannon thought that mastoidectomy would be necessary.

Dr. Weber presented a case of enlargement of posterior edge of septum, with symptoms persistent for eight years. Wasserman negative. Diagnosis lies between hypertrophy due to sinus infection or a tumor. In discussion, Dr. Matthews advised biopsy and Dr. Wanamaker suggested rhinoscleroma.

Cases were presented by Drs. A. W. Howe, Dyer and Goss.

Dr. Waltz read a paper on pulsating exophthalmos.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

An Index of Differential Diagnosis of Main Symptoms. By Various Writers. Edited by Herbert French, C.B.E. (Military) M.A., M.D., . Oxon., F.R.C.P. London. Physician to H.M. Household, Physician and Lecturer, Guy's Hospital, Consulting Physician to Queen Alexandra's Military Hospital, Millbank. Fourth Edition. 701 Illustrations, including 79 fully colored figures. Cloth. 1171 pp. 7x10 inches. William Wood and Company, New York. 1928. $18.00.

It is a great pleasure to review this new edition of the most important and valuable work on differential diagnosis in the English language. The work has met with such merited recognition that, although it has been out of print for five years, some thirty thousand copies of previous editions have been sold and it has been translated into Italian and French. This is all the more extraordinary, considering the necessary high price for an enormous work of this kind. Some years ago in a new edition of Cabot's Physical Diagnosis he credited almost all the new matter therein to French's Index of Differential Diagnosis. In this connection it is a curious coincidence that the two outstanding books on diagnosis in this country, the present volume of French and the smaller book of Cabot, are both the progeny of William Wood and Company.

To those unfamiliar with this work it may be said that the general plan is that long followed in teaching differential diagnosis in medical schools. That is the presenting symptom or sign is written above and then all the diseases in which this symptom or sign are found are written below, and the other symptoms peculiar to each disease are discussed in turn, the diagnosis being arrived at eventually by exclusion. Let us suppose one has a case of general lymph gland enlargement. In this book the symptoms are arranged throughout the book according to alphabetical order so one need not consult the general index at all but turning to (page 471) Lymphatic Gland Enlargement one finds the discussion under two headings. 1. Generalized Enlargement, 2. Localized Enlargement. Under the first are included eleven different diseases and each is discussed in clear and concise language so as to enable the reader to decide in which category the disease he is studying belongs. There are twenty British authors of this volume, all among the most distinguished men of the Empire, for this work covers the whole domain of medicine, surgery, gynecology, ophthalmology, dermatology and neurology.

For example, one has a case of paralysis of the arm. One looks for the heading Paralysis of One Extremity. Here one finds an exhaustive discussion of how to determine that there really is paralysis by various forms of examination, and the questions that should be asked to bring out a fruitful history, and, in differential diagnosis, discussion is continued under Paralysis with and without muscular atrophy.

While the text of the book is arranged in alphabetical form as an index, yet in the back of the book there is a wonderful general index of all the contents. This consists of two hundred twenty-six pages of very fine print with every possible aid to the finding of the subject desired. One may look either under the names of diseases or symptoms, or the names of organs or parts. The cross indexing throughout the book is marvelously done. In the main index six pages are devoted to pain in different parts, and all through the index the more important topics are placed in large block type. The illustrations and colored figures distributed liberally throughout the text adds greatly to the value of the book. Altogether, as we said in the beginning, there is no book so valuable on differential diagnosis in the English language as this, and what is more important to every practitioner of every branch of medicine than diagnosis? Therefore we consider that there is no book which will prove of more practical worth to every practitioner of medicine than this. It would make a good Christmas present for any member of the medical profession. We cannot commend it too highly.

Winslow.

The Nose, Throat and Ear. By John F. Barnhill, M.D., F.A.C.S., Professor of Surgery of the Head and Neck. Formerly Professor of Laryngology, Rhinology and Otology, Indiana School of Medicine, President of the American Laryngological, Rhinological and Otological Society. 45c Illustrations. Cloth. 604 pp. D. Appleton and Company, New York, 1928.

This is essentially a textbook for the undergraduate and the general practitioner and does not contain much that is new to the oto-laryngologist. The material is presented in the routine text book manner and its chief virtue lies in the omission of much of the dead matter that is carried, for no good reason at all, from edition to edition in so many textbooks. Among the omissions most appreciated are such terms as catarrhal, gouty, rheumatic, idiopathic and other vague unscientific terms which do not belong in modern scientific medical works. Many of the illustrations of instruments taken from catalogues might have been omitted without lessening the value of the book as there is a wealth of good original drawing illustrating the text.

Brugman.

Practical Surgery of the Abdomen. By George H. Juilly, M.D., Chief Surgeon to the French Hospital, San Francisco, Calif. With a Foreword by W. Wayne Babcock, M.D. With 1291 Illustrations, Some in Colors. Vols. I and II. $16.00. F. A. Davis Co., Philadelphia, 1928.

This present work which consists of two volumes has an appropriate title, inasmuch as the subject is presented in the most practical manner throughout. It is so broadly treated that a comprehensive view of all conditions discussed is given the reader, while general consideration, matters of etiology and symptoms with discussions of preparation and aftercare are described appropriately and from the modern viewpoint. The technic of operations within the abdomen, which occupies by far the greater portion of the work, is described with a detail and clearness that makes every step easy to follow. Important points are nowhere omitted and nothing is taken for granted. Of necessity there is a profusion of illustrations, and sketches are freely introduced that serve to refresh the memory on anatomic details or points of surgical importance. Conversely, features of relatively minor importance, but which are treated fully in textbooks on medicine and surgery, are mentioned briefly and only in relation to a practical phase in treatment. As a guide to every surgeon who operates within the abdomen these volumes cannot help but be of greatest value. Forbes.

Urological Roentgenology. (Annals of Roentgenology. A Series of Monographic Atlases. Edited by James T. Case, M.D., Ex-President of The American Roentgen Ray Society.) By Hugh H. Young, M.D., and Charles A. Waters, M.D. 499 pp. $2.00. Paul B. Hoeber, Inc., New York, 1928.

So complete is this volume that, instead of its being an atlas of urologic roentgenograms as appears on first impression, the reviewer finds that it is a textbook on urology. It goes most completely into the more frequent urologic lesions, the studies of case histories, and the technic of making urologic studies. An outstanding feature of the volume is the diagnosis index to case histories which are given in this atlas. This should be of considerable aid in diagnosis. Under each of the illustrations showing the roentgenograms is written a brief but complete case history, bringing out all of the valuable points in symptomatology and diagnosis. Many of the roentgenograms are further illustrated by fine drawings, showing the tissue removed and how it conforms to the roentgenogram findings. In the text proper, symptomatology and the treatment of the specific disease found are gone into very thoroughly. Many of the illustrations are taken from Kelly and Burnham's Diseases of the Kidneys, Ureter and Bladder. Among the interesting chapters are those on renal anomalies, obstructive conditions of the urinary tract, tuberculosis of the genitourinary tract, urinary lithiasis and tumors of the urogenital tract. The work naturally is the product of the urological department of Johns Hopkins Hospital, although the author has frequently quoted other workers in this field. The reviewer can recommend this work as a valuable addition to the reference library of the urologist. Peacock.

Urology. By Edward L. Keyes, M.D., Ph.D., F.A.C.S. Professor of Urology, Cornell University Medical College, etc. With 184 Illustrations in the text and twenty plates, two of which are in color. 763 pp. D. Appleton and Co., New York and London, 1928.

This work fulfills the requirements of a textbook as well as a surgical reference book of urology. It is well classified and arranged and the illustrations are very explanatory. The clinical experiences and observations of the author are combined in a very convincing but unbiased manner. He has not burdened the reader with the encumbering details of anatomy, embryology, histology and embryology, but has subordinated them to the more important and interesting clinical aspects of the various diseases.

The first several chapters supply the demands of the undergraduate students who are taking their initial course in urology, and yet it is not so elementary as to be useless to the practitioner. In these chapters he touches on the examination of the patient, pitfalls in diagnosis, the types of instruments necessary for the various urologic examinations and the cautions to observe in their use. The discussion on renal infections is complete but brief. The author emphasizes the importance of determining the renal threshold and potential capacity prior to surgical interference. He holds that the renal threshold can be increased in certain infections by reducing the functional demands of that organ. By reducing the fluid intake one not only increases the efficacy of the urinary antiseptics, but promotes the healing of the diseased organ as well, thereby increasing the compensation.

In the operative section the author becomes more emphatic in his own views. His methods of treatment are essentially conservative. He has not attempted to describe all the surgical procedures for the cure of urologic diseases, but has confined himself to those operations which from his personal experience or judgment seem best suited for the special requirement presented. Thus this revised volume is not an extensive treatise on urology, but a brief and complete clinical review of the subject, from which one may quickly gain accurate information and advice. Corlett.

Technique of Contraception. The Principles and Practice of Anti-Conceptional Methods. By James F. Cooper, M.D., Medical Director of the Clinical Research Department of the American Birth Control League, etc. 271 pp. $7.50. Day-Nichols, Publishers, New York City.

Whatever may be the differences of opinion among the medical profession as well as the laity regarding contraception and birth control, some form of this procedure is of universal practice. The author of this volume discusses the rational arguments in favor of a scientific and accurate application of methods of birth control. His opinions and conclusions are based on observation and study of 8000 clinical cases over a period of five years. The opinions of many prominent physicians and scientists are quoted in favor of methods for birth control and their reasons for this opinion are cited. The author reviews methods of contraception which have been in universal practice over a period of many years. He believes that the method he employs is the safest and best introduced. It is a combination of diaphragm pessary and contraceptive jelly. This pessary has been in use in Dutch birth control centers for forty years. It is herein presented with some modifications. Its employment calls for selection of a size suitable for the patient, who is instructed in its introduction and removal. Before introduction a portion of the author's lactic acid jelly is inserted, which has been demonstrated as an effective agency for the destruction of spermatozoa. Employed systematically and according to instructions, the author states this method is the most dependable yet introduced for the control of conception. A chapter presents statistical data of the employment of this method in various parts of this country and abroad. The author states that this volume is published for the use of physicians only, the publishers exerting their efforts to prevent its sale to the laity. Every physician interested in this subject will find this a valuable book for reference.

DISEASES OF THE EAR, NOSE AND THROAT, Medical and Surgical. By Wendell Christopher Phillips, M.D., Ex-President American Medical Association, Formerly Professor of Otology, New York Post Graduate Medical School and Hospital, etc. Seventh revised and enlarged edition. Illustrated with 615 halftone engravings and 37 plates. Cloth. 922 pp. $9.00. F. A. Davis Co., Philadelphia, 1928.

While this volume is arranged as a textbook, the material is so nearly complete and exhaustive that the experienced specialist will find it well worth his study. The author makes an especial appeal to the general physician to observe otologic symptoms related to general diseases and, conversely, reminds the otologists that ear diseases are closely related to general disease. The rehabilitation of the deaf patient is given a chapter which it well deserves, as the duty of the otologist does not end with giving a hopeless prognosis to the incurably deaf. The author believes that the audiometer is a valuable aid in testing the hearing and demonstrates the methods of using the apparatus. Among the newer subjects not mentioned in the book are agranulocytic angina and the use of contrast media in radiography of the paranasal sinuses. Both of these are active subjects in the literature at the present time. With these few exceptions this appears to be one of the most comprehensive volumes published on the subject in recent years.

BRUGMAN.

SURGICAL DIAGNOSIS In Tabular Outline. For Students and Physicians. By Dr. A. J. Cemach, Vienna, Austria. Authorized Translation, with Additions and Notes. By Edward L. Bortz, M.D., Associate in Medicine, Lankenau Hospital, Philadelphia. With Introductory Note by Dr. John B. Deaver. Cloth. 109 Tabular Forms and 129 Plates, with 548 Subjects, Many in Colors. F. A. Davis Co. Philadelphia, 1928. $12.00.

The present volume, which deals with surgical diagnosis, is handled in a convenient method for the student in this field. Many good works on this subject have failed to outline briefly but accurately important points in similarity and differences in conditions of close resemblance. This volume is supreme in this respect. A tabulation of all points which have bearing on the ultimate diagnosis is made with a brevity and completeness that makes it easy to visualize conditions. Plates and illustrations are used abundantly to elucidate the text. The work has been translated into English by Edward T. Bortz who has drawn freely on the clinical and pathological material from the surgical services of the Lankenau Hospital to supplement the vast experience of the original author. As a desk reference this book is indispensable, especially to the surgeon whose judgment must at all times be exercised in the clearest manner for the benefit of his patient. The publishers are to be congratulated on the beauty of the plates, which are mostly self-explanatory, and in fact on the admirable technical excellence of the whole book.

FORBES.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS. Covering Their Pathology, Diagnosis and Treatment. By Kellogg Speed, S.B., M.D., F.A.C.S. Associate Professor of Clinical Surgery, Rush Medical College of the University of Chicago, etc. Second Edition, Enlarged and Thoroughly Revised. 987 Engravings. Cloth, 952 pp. $11.00. Lea & Febiger, Philadelphia, 1928.

The following quotation from the preface describes in as suitable a manner as possible the nature of this volume. "The writing of the text and the selection of the illustrations have been done by the author himself, whose experience has been steadily enlarged by an active surgical contact with war conditions and by the care of a large fracture ward in Chicago." Every fracture and every dislocation seemingly is described and, generally speaking, the methods of treatment prescribed by the committee on fractures of the American College of Surgeons are followed. A very useful volume and it should be in the library of every surgeon treating fractures.

MURRAY.

A TEXT-BOOK OF SURGERY. By W. Wayne Babcock, M.D., F.A.C.S., Professor of Surgery and of Clinical Surgery in the Temple University, Philadelphia; Surgeon to the Samaritan Hospital and to the American Hospital for Diseases of the Stomach. Octavo of 1367 pp. with 1050 illustrations, 9 of them in colors. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $10.00 net.

One is amazed at the completeness with which the subject of surgery has been handled in this modern textbook. Dr. Babcock has long been known as an original and forceful writer and producer in the surgical field, and a textbook by him would naturally include much original work. In this we are not disappointed. It includes, also, the best in the present day teaching and practice of surgery as taught by the world's authorities. Each subject is dealt with fully and brevity has not been permitted to sacrifice fulness of description. Today the requirements of the student and practitioner are parallel and a textbook should supply the needs of both. To do this an author must be dogmatic and thereby aid in the standardization of surgical practice. Dr. Babcock has been unusually successful in accomplishing this result. The work is replete with illustrations,

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which number more than one thousand, and some idea may be gained of the amount of text from the size of the index, which includes over twenty thousand references. We commend this volume for the exhaustive and thorough treatment of its subject and for its authoritative and strictly modern teaching.

FORBES.

ESSENTIALS OF PRESCRIPTION WRITING. By Cary Eggleston, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical School. Fourth Edition, Revised. 16mo of 153 pages. Philadelphia and London: W. B. Saunders Co., 1928. Cloth, $1.50 net.

This little volume offers to the student the necessary principles for prescription writing. It is not padded with sample prescriptions. Sufficient Latin grammar is presented to serve the student who has not studied this language. The author strongly advocates writing prescriptions in English, and a chapter is devoted to grammatic construction of the prescription. Also, being an advocate of the metric system, attention is given to its use. Other interesting features of the subject are discussed.

CRITERIA FOR THE CLASSIFICATION AND DIAGNOSIS OF HEART DISEASE. By a Committee: Joseph H. Nainton, M.D., Robert L. Levy, M.D., W. C. Munly, M.D., M.C., U. S.A., Harold E. B. Pardee, M.D., Chairman. Arranged in Conformity with the Nomenclature for Cardiac Diagnosis Approved by the American Heart Association. 98 pp. $1.50. Paul B. Hoeber, New York, 1928.

For the most effective study of any kind of disease, there should be uniformity of nomenclature and uniform criteria for its use. The committee preparing this booklet was appointed to meet this end. Prepared by these experts, these criteria are a practical guide for correct diagnosis. Particular attention is called to the uniform set of terms for describing heart sounds and murmurs. The criteria appear under the groupings of nomenclature and for diagnosis. Under each they are arranged as to etiology, anatomy, physiology, functional capacity, possible heart disease and potential heart disease. The exact meaning and correct use of all terms used in connection with heart disease are here presented. With the details herein contained thoroughly mastered, one should be in a condition to recognize with accuracy the diagnosis and pathology of the diseases of the heart.

STRICTLY PRIVATE. Being the Intimate Diary of a Medical Practitioner. By Dr. Maurice Chideckel. 335 pp. $3.50. The Stratford Company, Boston, 1928.

This is a humorous account in diary form of a physician's experiences and impressions during a year of practice among the cosmopolitan population of a large city. Psychiatric as well as physically ill patients were included in the doctor's rounds. His comments with regard to the lighter side of serious situations make delightful reading for his professional contemporaies.

OLMSTED.

THE SURGICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume 8, number 5. (New York Number, October, 1928.) 293 pages with 98 illustrations. Per Clinic Year (February 1928 to December 1928), Paper $12.00, Cloth $16.00. Philadelphia and London: W. B. Saunders Company, 1928.

This volume offers clinical reports on many interesting surgical conditions. Stanley-Brown relates his experiences in the treatment of phlebitis by gentian-violet intravenous injections. He cites two cases where this condition followed operation, in which the inflammatory condition promptly subsided following this treatment. Roberts offers a preliminary report of a new antiseptic, "MBGV-5," composed of methylene-blue and gentian-violet. As a skin antiseptic it is as nearly 100 per cent efficient as any yet developed. He states much bacteriologic work must be done to verify the completeness of antisepsis obtained. Gordon describes two splints which he believes particularly useful. One is for the support of hands and fingers with the object of permitting movement at the wrist or metacarpal joints or both. The other, made from discarded carton-box sides, or similar material, forms a temporary splint for the ankle which it is difficult to duplicate. The details of construction of both of these splints are presented. Clinical reports cover the usual wide range of surgical experiences usually presented in these volumes.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month). Volume 12, Number 3. (New York number, November, 1928). Octavo of 334 pp. with 64 illustrations. Per Clinic year, July, 1928 to May, 1929. Paper, $12.00; Cloth, $16.00 Net. Philadelphia and London; W. B. Saunders Company, 1928.

This volume presents clinical reports on a great variety of interesting conditions. Fellows gives his views on the chronic appendix, which is now a subject of much controversy. He says this condition is one in which there has developed an atrophy of the glands and lymphoid tissue with a subsequent replacement fibrosis, frequently following an acute inflammatory reaction. Suggestive symptoms are detailed with methods of examination for accurate diagnosis. He states that surgical removal of the chronically diseased appendix results in a uniform and practically perfect result. This is in contrast with the statements of some other writers that chronic appendicitis, as such, rarely exists, as indicated by persistence of pain in a large proportion of cases after appendectomy. Archer reviews the bugbear of medicine, chronic arthritis. He makes the two classifications of chronic infectious arthritis and arthritis of the menopause, the latter including more than twenty-five per cent. Graves presents an interesting case of shoe-dye poisoning induced by nitrobenzene in the dying process. The discussion refers to a large number of cases resulting from the use of hair dye, paints and often laundry inks. Many other equally interesting and instructive cases are cited.

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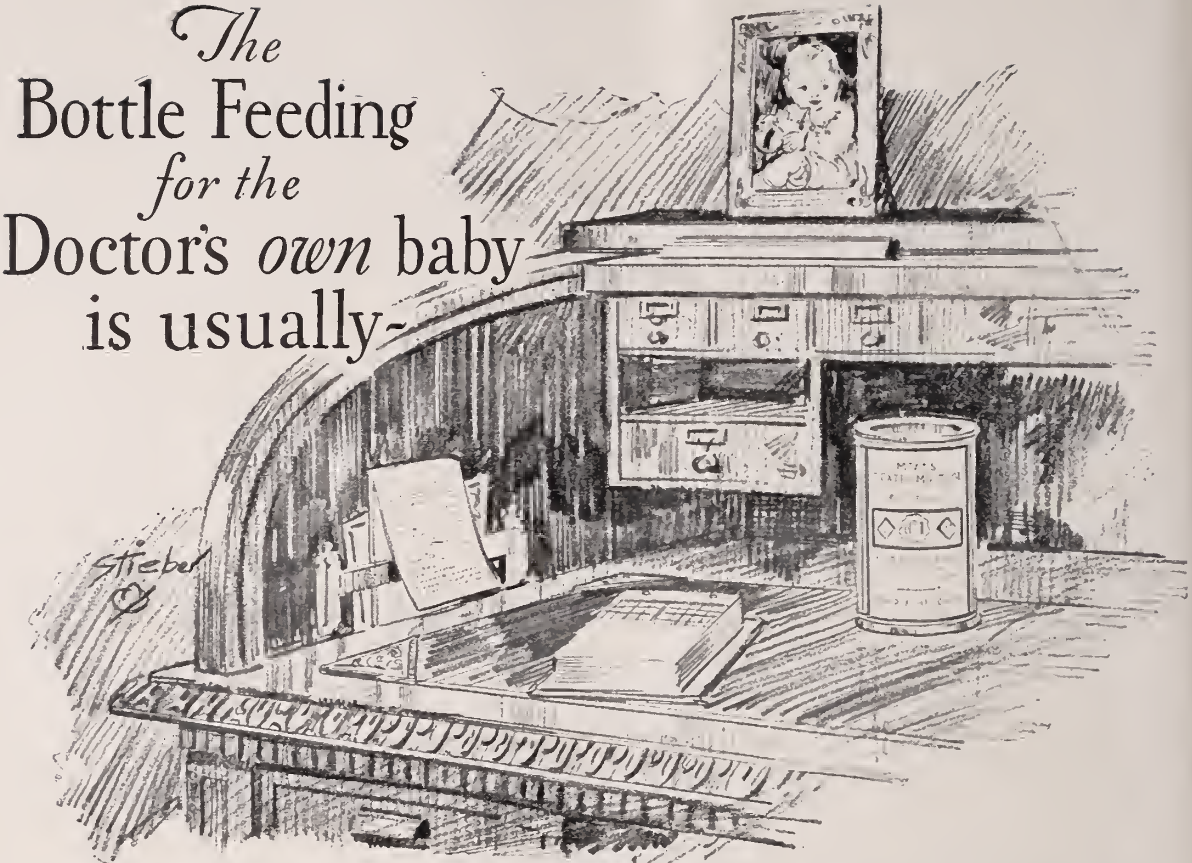

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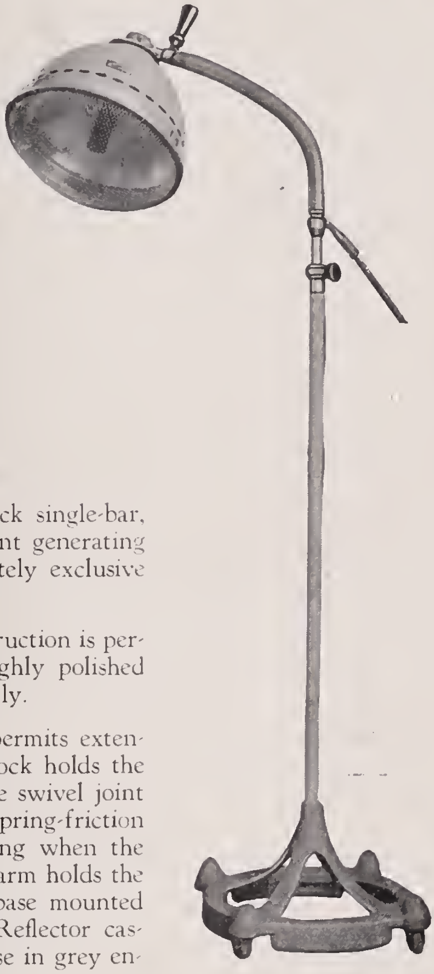

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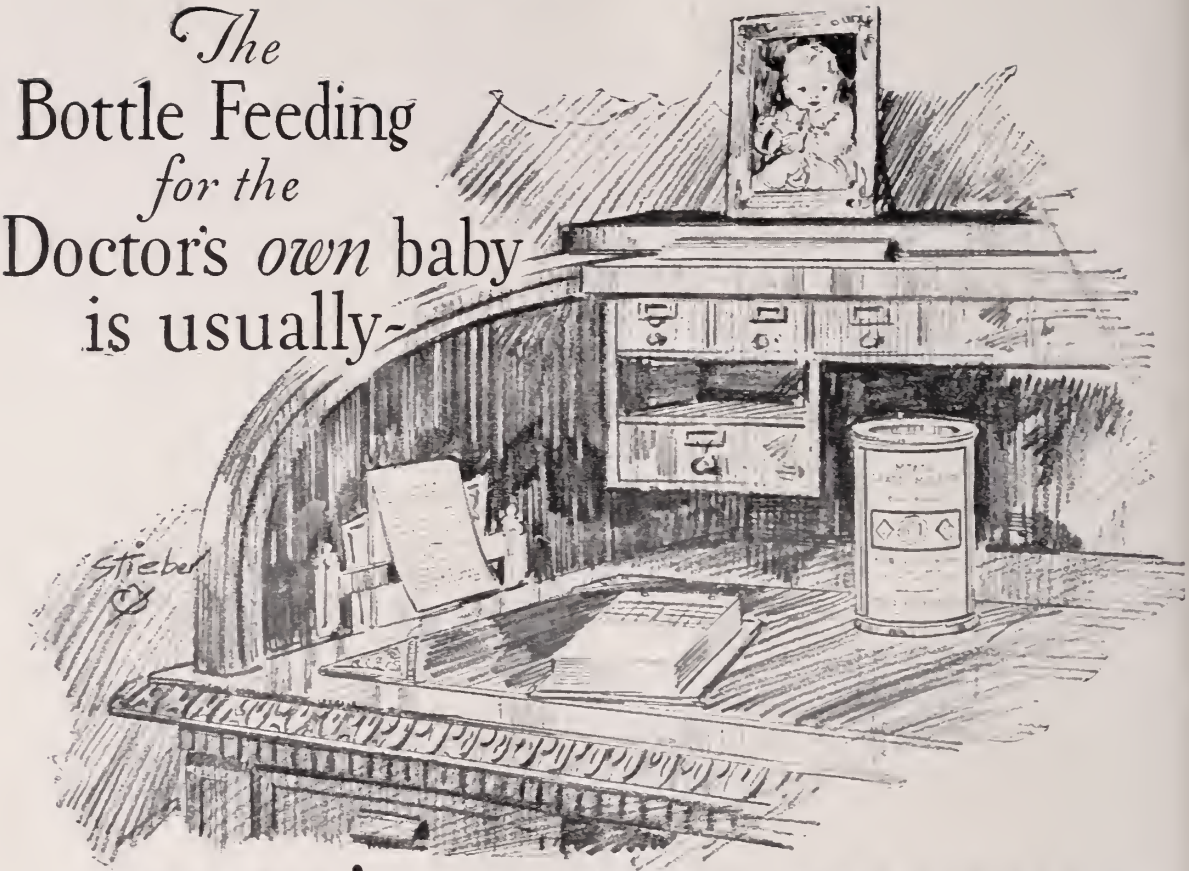

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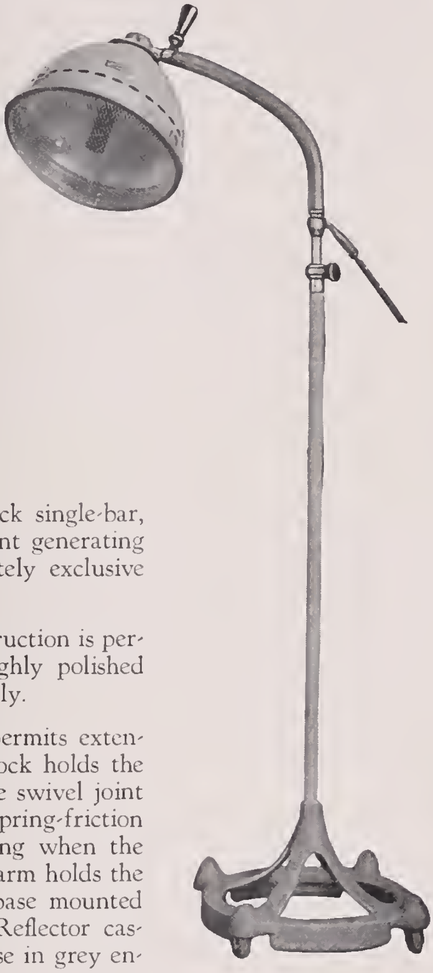

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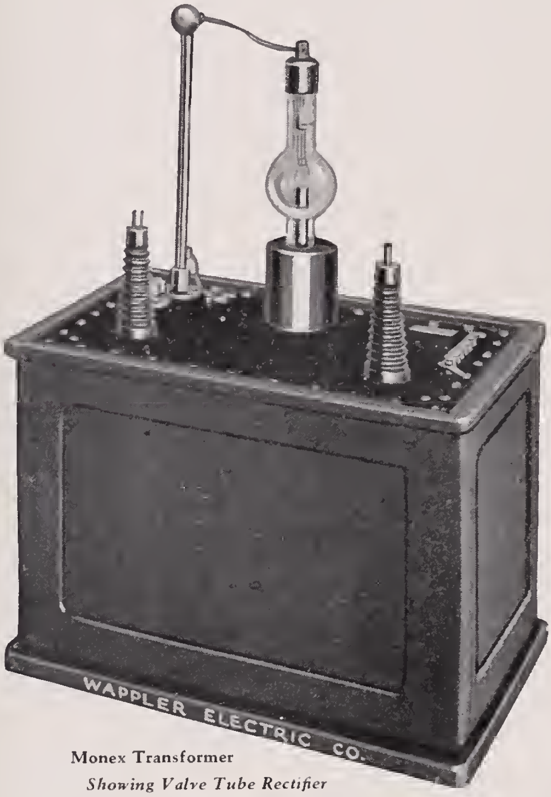

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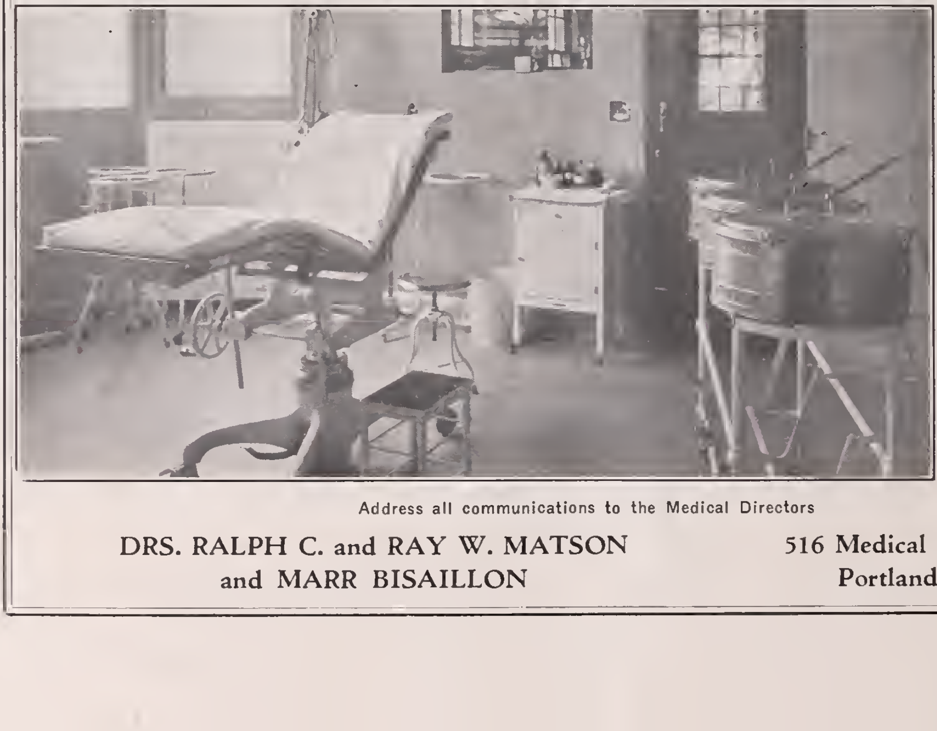

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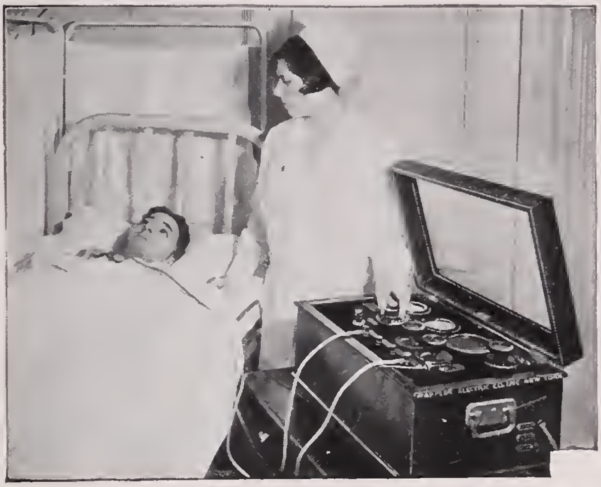

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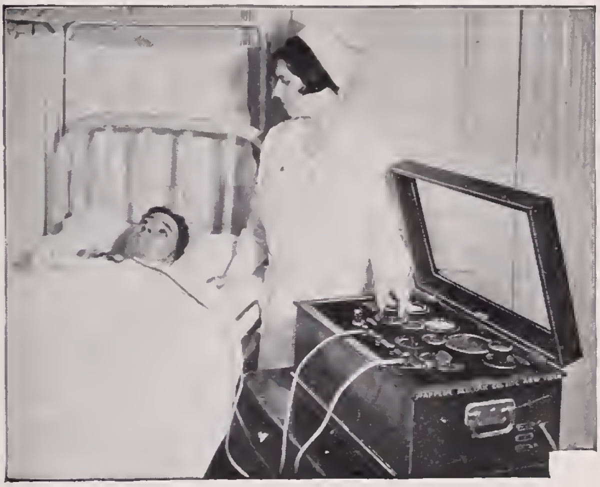

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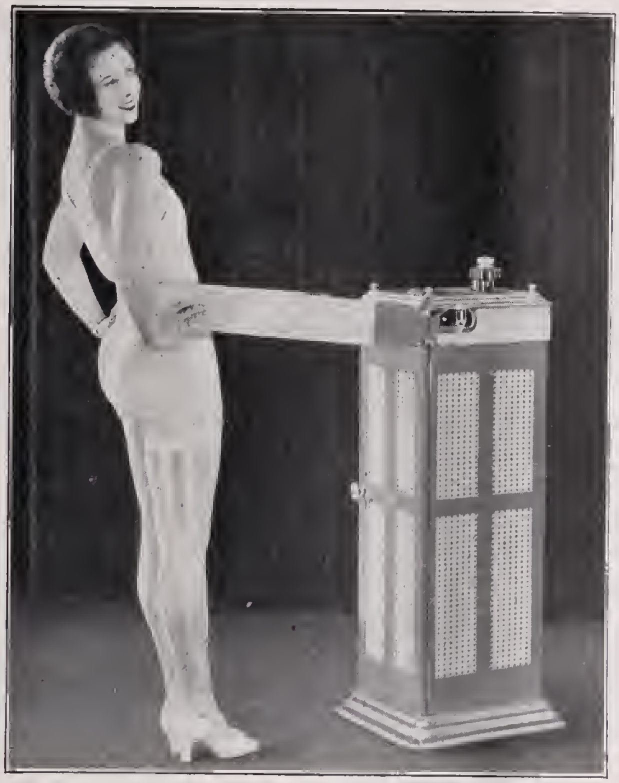

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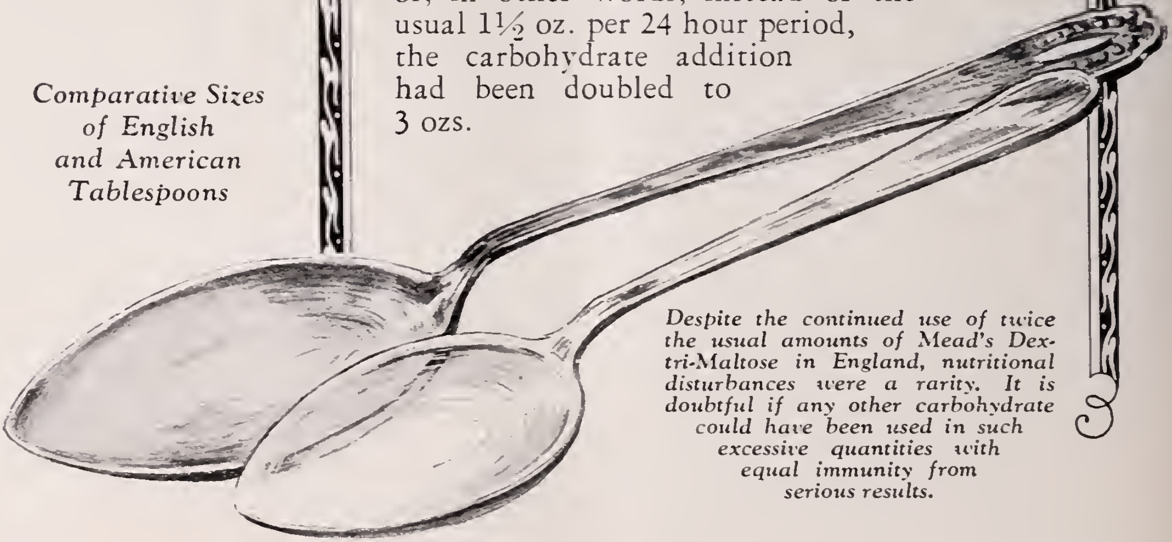

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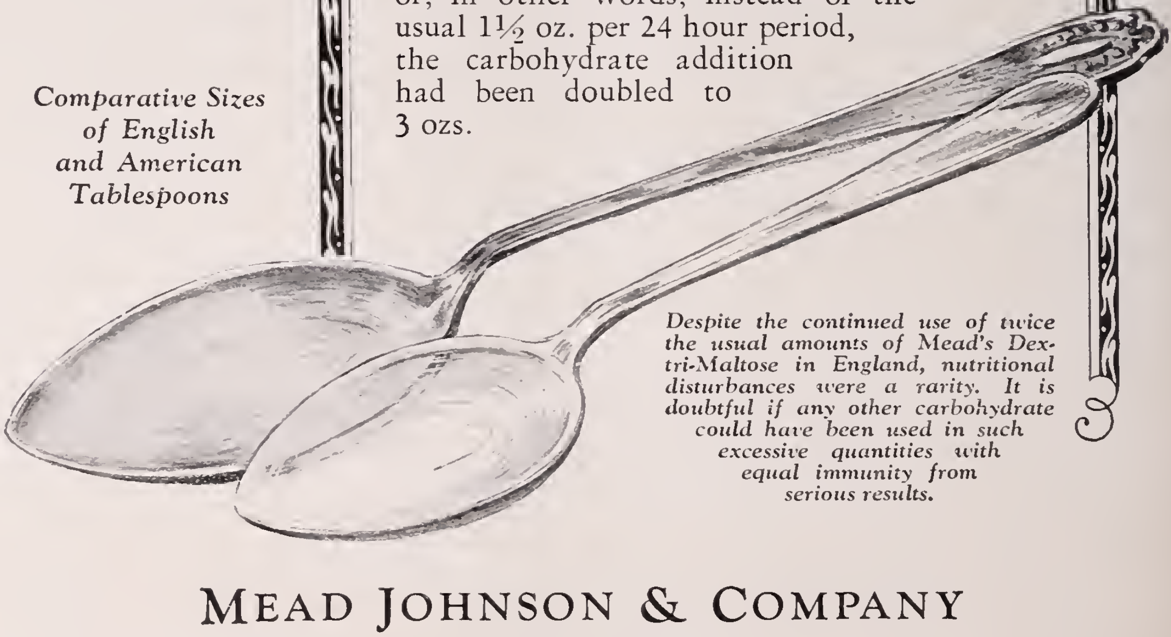

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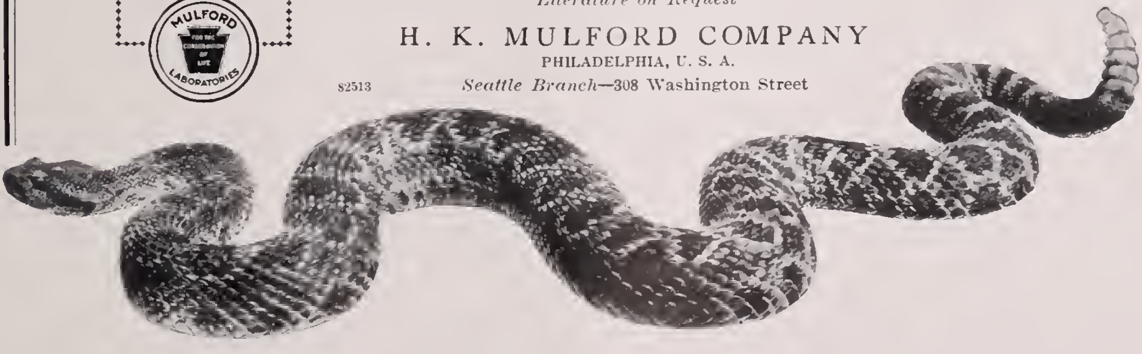

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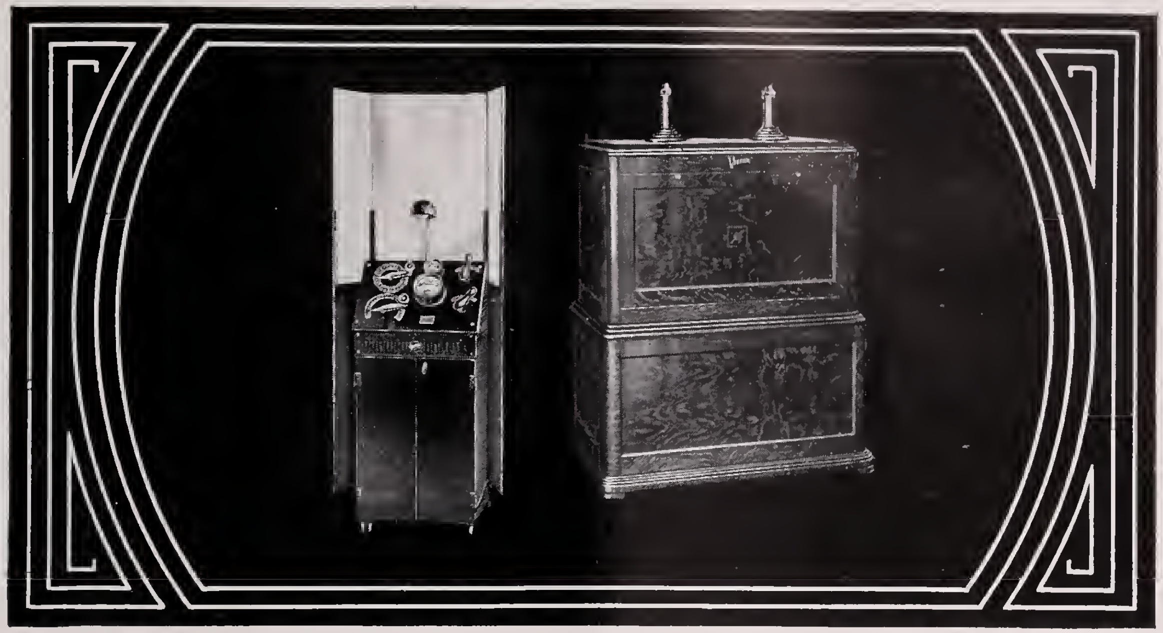

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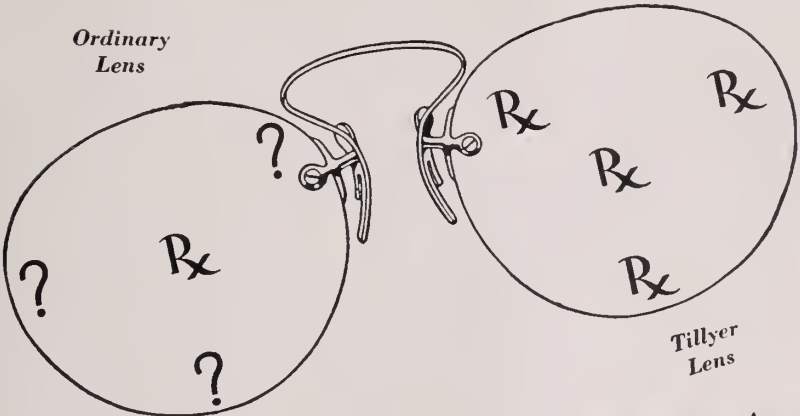

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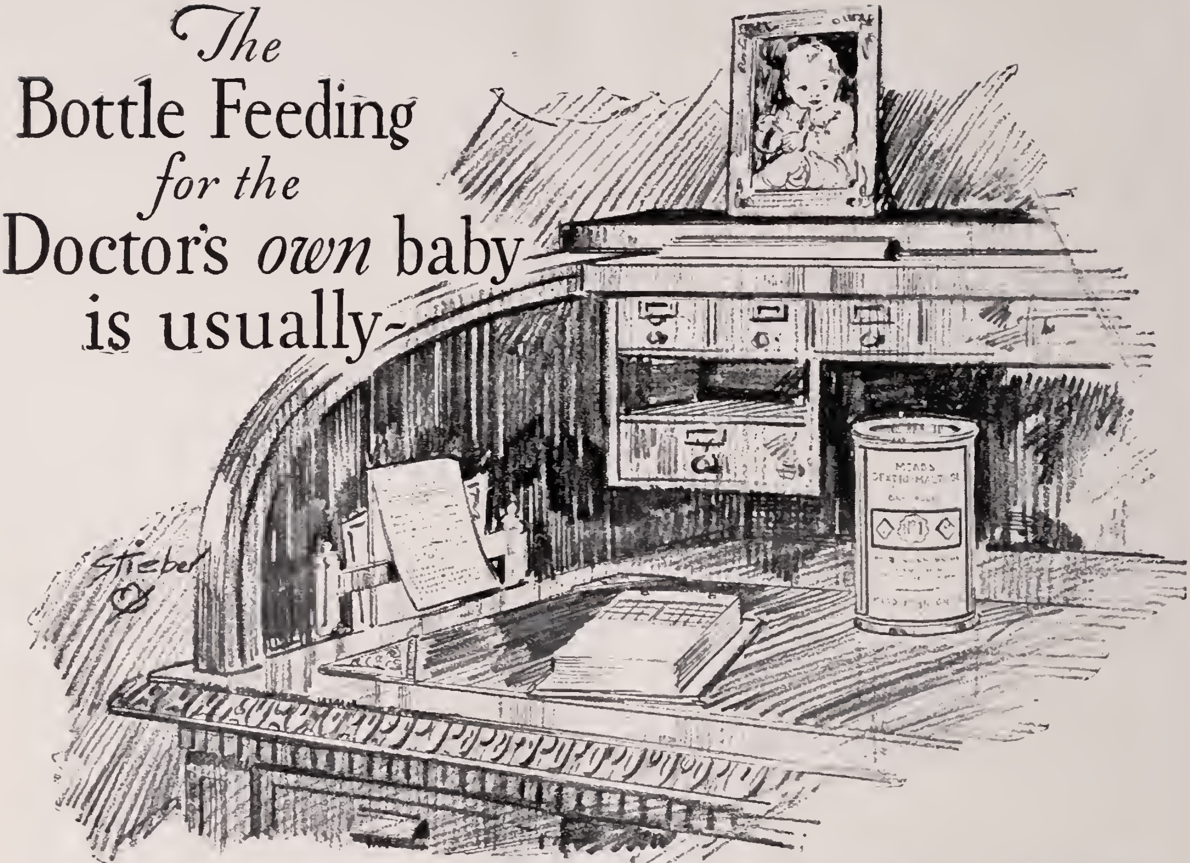

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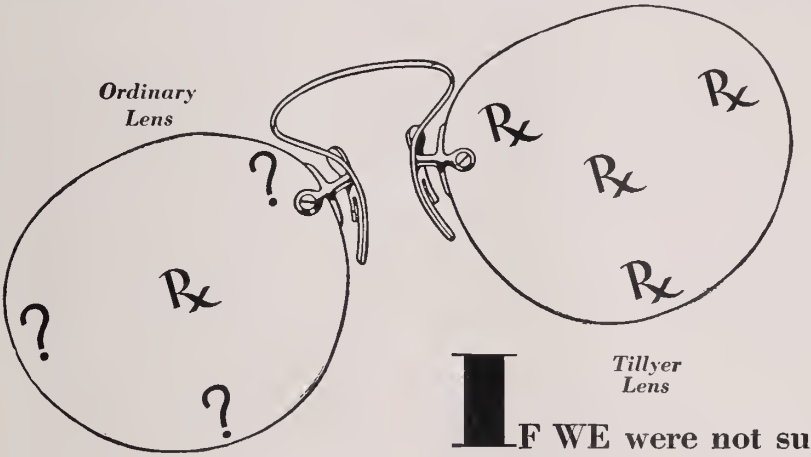

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